



**CEDPL**

SOUTH EASTERN UNIVERSITY OF SRI LANKA

# INFORMATION TECHNOLOGY-11

BACHELOR OF ARTS (EXTERNAL - GENERAL)  
ACADEMIC YEAR- 2014/2015  
YEAR -1, SEMESTER-11

CENTRE FOR EXTERNAL DEGREES AND PROFESSIONAL LEARNING

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# **INFORMATION TECHNOLOGY - II**

**Bachelor of Arts**

**Academic Year 2014/2015**

**Year - I Semester - II**

**JM Nazeer**



**Published by**

**South Eastern University of Sri Lanka**

## **Acknowledgement**

My first thanks are to the almighty lord for giving me this opportunity.

I would like to express my gratitude to staff members of the Computer Unit for their support and motivation in the making of the course Manual.

A special thanks to my family for their support and encourage me in spite of the time it took me away from them.

Many people have been involved, directly or indirectly, in the completion of this course manual and I would like to take this opportunity to express my gratitude to them.

I extended my sincere thanks to the Centre for External Degrees and Professional Learning, South Eastern University of Sri Lanka for publishing this book.

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Oluvil

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## **ICT 12012 - INFORMATION TECHNOLOGY -II**

### **Introduction:**

This course provides basic to a level of intermediate knowledge on network, communication and internet usages. The presentation applications module provides knowledge on MS PowerPoint presentation application for multi-media presentations. The database management module provides the main application for this course is the MS Access. The course provides Database management procedures such as relationship, queries and forms and lead students to develop a database application.

### **Objective of the Course.**

- Understand the concept of communication.
- Use network applications
- Use PowerPoint software and their multi-media presentations.
- Understand Database software and their general applications
- Use relationship, queries and forms on data.

### **Learning Outcomes of the Course:**

By the end of the course students will be able to;

- Understand and distinguish various types of networks
- Create power point presentation files
- Perform a skilled presentation.
- Understand database management
- Demonstrate the ability to manipulate data by queries and forms
- Use Built-in- database Functions.
- Create a database application

### **Method of Teaching & Learning (TL):**

Students do not require any previous knowledge or experience with computers to follow this course. The following TL methods will be used to illustrate the various topics of the course.

**TL 1 Lecture**

**TL 2 Practical**

### **Method of Evaluation:**

- |                                    |              |
|------------------------------------|--------------|
| - Semester-End Written Examination | - <b>70%</b> |
| - Continuous Assessment            | - <b>30%</b> |

## Unit 1 Data Communication

### 1.1 Concepts and Definitions

#### 1.2 Data Transmission modes

### 1.1 Concepts and Definitions

Data communication is the process of sending data electronically from one computer or similar device to another. Thus, making the sharing of data, hardware, and software possible. In many companies the trend has been away from using a single large computer to several smaller machines connected together.

Computers within the same room or groups of buildings can share data directly through cables; while computers far apart use various forms of data communication, such as telecommunication, to share data. Telecommunication is the use of a communication facility, such as a telephone system or microwave relays (radio stations), to send data between devices.

Data communication today considers numerous factors, including cost of hardware, software, and performance of devices when networking computers. This consideration is given to ensure that the selected means of communicating will be long-lasting for current and future standards of communicating.

Two computers are said to be interconnected if they are able to exchange information's. The connection need not be via a copper wire; fiber optics, microwaves, and communication satellites can also be used. By requiring the computer to be autonomous, we which to execute from our definitions systems in which there is a clear master/slave relation. If one computer can forcibly start, stop, or control another one, the computers are not autonomous. A system with one control unit and many slaves is not a network; nor is a large computer with remote printers and terminals.

### 1.2 Data Transmission modes

The amount of data that can be transmitted over a communication channel. There are several modes of data transmission between sender and receiver.

#### Simplex



#### Half-duplex



## Full duplex



Today which allows us to transmit messages to each other, here are some:

Internet, Web (documents), E-mail, Instant Messaging, Chat Rooms, Newsgroups, FTP, Video Conferencing, Modem

## Unit 2 Data Transmission Media / Communication channels

### 2.1 Guided Transmission Media.

### 2.2 Wireless Transmission

Transmission media refers to the many types of **cables** and **other mediums** that carry the signal from the sender to the receiver. The most basic hardware required for communication is the media through which data is transferred. There are several types of media, and the choice of the right media depends on many factors such as cost of transmission media, efficiency of data transmission and the transfer rate.

There are two types of transmission medium

1. Guided / Wired. - The **medium** is more important.
2. Unguided / Wireless - The **bandwidth** produced by the **antenna** is more important.

Wireless transmission requires **no** physical media but relies on electromagnetic waves such as those found in television and radio broadcasts. This type of media is such as microwave and satellite transmission.

### 2.1 Guided Transmission Media

Some of the following transmission Medias is as follows:

1. **Two wire open line:** This is the simplest of all the transmission media. It consists of a simple pair of metallic wires made of copper or sometimes aluminums of between 0.4 and 1mm diameter, and each wire is insulated from the other. There are variations to this simplest form with several pairs of wire enclosed in a single protected cable called a multi core cable or molded in the form of a flat ribbon.

This type of media is used for communication within a short distance, up to about 50 M, and can achieve a transfer rate of up to 19200 bits per second.

2. **Twisted Pair cable:** A twisted pair consists of a pair of insulated conductors that are twisted together. The advantages of a Twisted Pair cable over the Two Wire Open Lines are; it provides better immunity from spurious noise signals. As the Two Wires are closed to each other, both pick equal interferences caused by extraneous signal sources and this reduces the differential signal added by the noise.



Twisted Pair cable is used for communication up a distance of 1 KM and can achieve a transfer rate of up to 1-2 MBPS. But as the speed increased the maximum transmission distances reduced, and may require repeaters.



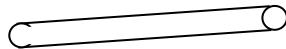
Twisted pair cables are widely used in telephone network and are increasingly being used for data transmission.

3. **Co-axial Cable:** A co-axial cable consists of a solid conductor running co-axial inside a solid or braided outer annular conductor. The space between the two conductors is filled with a dielectric insulating material. Larger the cable diameter, lower is the transmission loss, and higher transfer speeds can be achieved. A co-axial cable can be used over a distance of about 1 KM and can achieve a transfer rate of up to 100 MBPS.



A co-axial cable is of two types- a 75 Ohm cable which is used by the cable TV operators and 50 Ohm cable which is used in high speed broad band networks and is low loss cables.

4. **Fiber Optic Cables:**



A fiber optic cable carries signals in the form of fluctuating light in a glass or plastic cable. An optical fiber cable consists of a glass or plastic core surrounded by a cladding of a similar material but with a lower refractive index. The core transmits the light while the change in refractive index between the core and the cladding causes total internal reflection, thus minimizing the loss of light from fiber.

As light waves gave a much wider bandwidth than the electrical then the electrical signal and are immune from electromagnetic interferences, this leads to high data transfer rate of about 1000 mega bites per second & can be used for long & medium distance transmission links.

## 2.2 Unguided Transmission Media

### Radio, Microwaves & Satellite Channels:

Radio, Microwaves & Satellite Channels use electromagnetic propagation in open space. The advantage of these channels lie in their capability to cover large geographical areas & being inexpensive than the wired installation.

The demarcation between radio, Microwave & satellite channels lie in the frequencies in which they operate. Frequency below 1000 MHz are radio frequencies & higher the Microwave frequencies.

The radio frequency transmission may be bellowing 30 MHZ above 30 MHZ & thus the techniques of transmission are different. Owing to the characteristics of the ionosphere, frequencies bellow 30MHZ are reflected back towards the surface of the earth. Above 30Mhz propagation is on line of sight paths. Antennas are placed in between the line-of- sight paths to increase the distance. Radio frequencies are prone to attenuation and, thus, they require repeats along the path to enhance the signal. Radio frequencies can achieve data transfer rate of 100 Kbps to 400 Kbps.

Microwave links use line- of- sight transmission with repeaters placed every 100-200 Kms. Microwave links can achieve data transfer rates of about 1000 Mbps.

Satellite links use microwave frequencies is the order of 4-12 GHz with the satellite as a repeater. They can achieve data transfer rates of about 1000 Mbps.

## **Unit 3 Introduction to Network**

- 3.1 Network Basics
- 3.2 LAN, WAN and MAN
- 3.3 Network Topologies
- 3.4 Switching Techniques
- 3.5 Network Devices

### **3.1 Network Basics**

Communication using computer has brought a revolution in the world of computer technology, particular in the field of computers. We have always heard of networking or the term network, a network is a way or means of transmitting or receiving information one or more.

In computing networks, the origin of the information request utilized the service of a network to locate & return the information.

Peer networking does not need pre- defined networking addressing. Instead, each resource on the network is seen as a peer. Each network resource is a peer to the other network resource. When a new network resource joins the network it introduced itself & notifies its peer to any other network resources that it knows about peer networks are share network information.

The entire computer network can be classified into two board categories. They are (a) LAN (Local Area Network) (b) WAN (Wide Area Network)

### **3.2 LAN, WAN and MAN**

#### **Local Area Networks (LAN):**

Local area network, generally called LANs, is privately-owned networks with in a single building or campus of up to a few KM in size. They are widely used to connect personal computers and workstation in company offices and factories to share resources (e.g., printers) and exchange information. LANs are distinguished from other kinds of networks by three characteristics:

1. Their size,
2. Their transmission technology,
3. Their topology.

LANs are restricted in size, which means that the worst-case transmission time is bounded and known in advance. Knowing this bound makes it possible to use certain kinds of designs that would not otherwise be possible. It also simplifies network management.

### **Metropolitan Area Networks (MAN):**

A **metropolitan area network**, or **MAN** (plural: MANs, not MEN) is basically a bigger version of a LAN and normally uses similar technology. It might cover a group of nearby corporate offices or a city and might be either private or public. A MAN can support both data and voice, and might even be related to the local cable television network. A MAN just has one or two cables and does not contain switching elements, which shunt packets over one of several potential output lines.

### **Wide Area Networks (WAN):**

A **wide area network**, or **WAN**, spans a large geographical area, often a country or continent. It contains machines intended for running user (i.e., application) programs. We will follow traditional usage and call these machines **hosts**. The term **end system** is sometimes also used in the literature. The hosts are connected by a **communication subnet**, or just **subnet** for short. The job of the subnet is to carry messages from host to host, just as the telephone system carries words from speaker to listener. By separating the pure communication aspects of the network (the subnet) from the application aspects (the hosts), the complete network design is greatly simplified.

In most WANs, the network contains numerous cables or telephone lines, each one connecting a pair of routers. If two routers that do not share a cable nevertheless wish to communicate, they must do this indirectly, via other routers. When a packet is sent from one router to another via one or more intermediate routers, the packet is received at each intermediate router in its entirety, stored there until the required output line is free, and then forwarded. A subnet using this principle is called a **Point to Point, store and forward** or **packet switched** subnet. Nearly all wide area networks (except those using satellite) have store and forward subnet. When the packets are small and all the same size, they are often called **cells**.

### **Wireless network:**

Mobile computers, such as notebook computers and personal digital assistants (PDA) are the fastest growing segment of the computer industries. Many of the owners of these computers have desktop machines on LAN's and WAN's back at the office and want to be connected to their home base even when away from home or en route. Since having a wired connection is impossible in cars and airplanes, there is a lot of interest in wireless networks.

Wireless networks come in many forms. Some universities are already installing antennas all over campus to allow students to sit under the trees and consult the libraries card catalogs. Here the computers communicate directly with the wireless LAN in a digital form. Another possibility is using a cellular (i.e. portable) telephone with a traditional analog modem. Direct digital cellular service, called **CDPD (Cellular Digital Packet Data)** is becoming available in many cities.

## Network Hardware

It is now time to turn our attention from the application and social aspects of networking to the technical issues involved in network design. There is no generally accepted taxonomy into which all computer networks fit, but two dimensions stand out as important: transmission technologies and scale. We will now examine each of these in turn.

Broadly speaking, there are two types of transmission technologies:

1. Broadcast networks.
2. Point-to-point networks.

**Broadcast networks:** It has a single communication channel that is shared by all the machines on the network. Short messages, called **packets** in certain contexts, sent by any machine are received by all the others. An address field within the packet specifies for whom it's intended. Upon receiving a packet, a machine checks the address field. If the packet is intended for itself, it processes the packet, if the packet is intended for the other machine, it is just ignored.

Broadcast systems generally also allow the possibility of addressing a packet to all destinations by using a special code in the address field. When a packet with this code is transmitted, it is received and processed by every machine on the network. This mode of operation is called **broadcasting**. Some broadcast systems also support transmission to a subset of machines, something now has **multicasting**.

**Point-to-point networks:** It consists of many connections between individual pairs of machines. To go from the source to the destination, a packet on this type of network may have to first visit one or more intermediate machines. Often multiple routes, of different lengths are possible, so routing algorithms play an important role in point-to-point networks. As a general rule (although there are many exceptions), smaller, geographically localized networks tend to use broadcasting, where larger ones usually are point-to-point.

Whenever we want two devices – transmitting and receiving device to communicate with each other, we need hardware to achieve that. We would be discussing about the various hardware such as:

- 3.1 Sender and Receiver hardware
- 3.2 Communication devices
- 3.3 Communication channels

### Sender and Receiver Hardware:

Following hardware are used for handling communication messages, data transfer etc.

### **Nodes and workstations:**

Data communication is done using various communication devices and softwares interconnected for information exchange. The devices used to communicate a data in communication network are called Workstations. These workstations may be computer, terminal, printer, telephones and other communication devices. Each workstation is connected to something called a Data Communication Network Mode.

### **LAN (Local Area Network)**

As numbers of system grow within an organization, a need is felt for sharing expensive resource and exchanging data and information between systems. This need of information exchange and resource and sharing with in a organization has given birth to a local area network or LAN.

A LAN is a data communication network, which connects many computers or workstation ( Computer's Terminals, Printer etc.) and permits exchange of data & information among themselves, with in a localized area, typically confined to a building, or a cluster of buildings. The distance between two communications prints connected on the same LAN channels is usually up to 02 to 05 kms.

LANs are not rigidly defined but tend to share most of all of the following characteristics.

- The transmission media is shared by all the connected devices in the network.
- Each device is connected in the network can either operate stand alone or in the network.
- Area covered is small.
- Data transfer rates are high, usually 1 Mbps- 100 Mbps (Million of bits per second).
- Each device connected in the network can communicate with any other device in network.
- Cost of setting up the network is usually low.

## **3.3 Network Topologies**

### **LAN Topology**

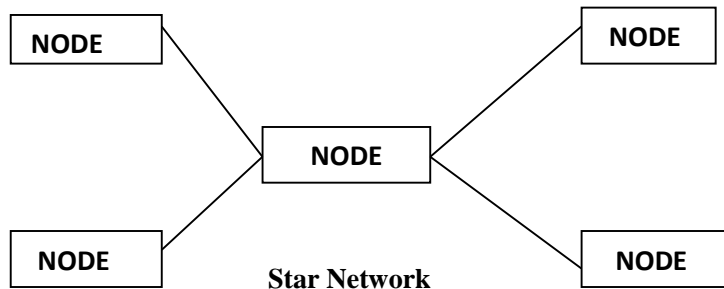
A network topology refers to the physical lay out of the network in which all the devices are connected. This includes all the hardware that makes up the network. The points of the connection to the network by the station are calls Nodes or Link stations. There are several types of topographical design & strategies are used to implement LAN. The majority of these are based on three types of topologies.      **a) Star**                      **b) Bus**                      **c) Ring**

Each topology has its advantages & disadvantages.

### **Star Topology**

Star topology is shown bellow. In this topology. A number of stations are connected directly to a central station or controller. Communication on the connecting links between the stations &

the central station of the star topology can be bi- directional and are point to point. A station on this type of network passes an information frame to the central controller, which then forwards the information to the destination station. The central controller manage and controls all communication between stations on the network.

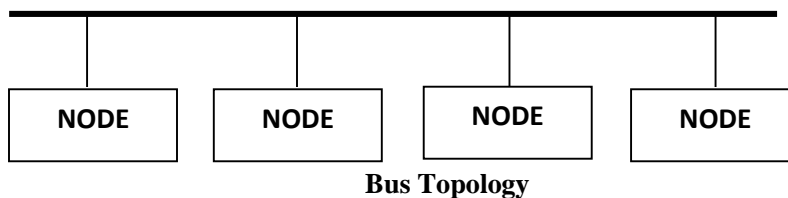


Failure of a station on a star network is easy to detect and can be remove from the network. However, failure of the central controller will disable communication through out the whole network.

### **Bus Topology**

A bus topology is shown bellow all stations are connected to a single communication line. This single communication line is referred to a bus. Information frames originating at a station are propagated away from the station in both directions on the bus. Each station on the bus interrogates the information frame destination address failed for its on addresses. If the destination failed does not mach the station address, the station discards the information frame back on to the bus. If the destination address matches the station addresses, it accepts the information frame & processes the frame.

An extension to the bus topology is tree topology is in the following figure. Tree topology extends the branches of the bus topology allowing more stations to access the bus.

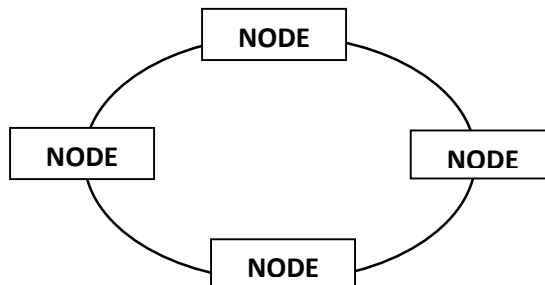


On a bus or tree network there is no central point for management & control. These function ions are distributed to each station on the bus. A brake in the bus can be difficult to locate but limits the outage to communications between stations that traverse the broken point.

### **Ring Topology**

A ring topology is shown bellow. Local area network that have each station attached to an adjacent station using point to point links from a physical ring. Each station attached and active

to the ring regenerate the information frame, then retransmits the information frame on the ring. The ring itself is logically circle and the information travels in one direction.



Failure of a station in a ring t **Ring Topology** g because the information frame is not regenerated. Additions or deletions of stations of the ring can be disruptive, if the changes are not managed properly.

### **LAN Hardware and Software**

As we have seen so far, to realize a LAN process, several functions are to be performed. These are so specialized in nature the require hardware specially built for such purpose. Here we will discuss briefly the basic hardware components of LAN, these are:

- a. Transmission channel
- b. Network Interface Unit (NIU)
- c. Servers
- d. Work Station

#### **a. Transmission Channels**

Generally following four types of channels are used for data communication in a LAN. They are:

- i. Twisted Pair Cable
- ii. Coaxial Cable
- iii. Fiber Optic Cable
- iv. Radio waves

#### **b. Network Interface Units (NIU)**

Network interface units connect each device in the LAN network to shared transmission device. It contains the rules or logic to access the LAN. NIU is also used for to implement LAN protocols and for device attachments. Its functions depend on the type of topology used in LAN.



### **c. Servers**

One of the major benefits of implementation of LAN is sharing expensive resources such as storage device, printer etc. this is achieved through providing servers on the LAN. It is a dedicated computer that controls on or more resources. This contains both hardware & software for LAN. Three major categories of servers used in LANs are

- i. File Server
- ii. Printer Server
- iii. Modem Server

In a networking file server is used to share storage space for files. Beside providing storage space for files in a LAN environment, it is used for talking periodical backup, and also to provide gateway to other servers with in & between LANs.

Similarly printer server is use to handle printing works of all workstations connected in the network.

In the LAN environment also modem is required to get connected to other network or simply to use a telephone. A modem server is used to share these expensive resources by all connected workstation in a networking ring.

### **LAN Software/ Operating System**

As the name suggest LAN operating system is required to operate on the LAN system, manage the tremendous work load with a number of various types of server attached to it. It has basically two aspects (i) Server Software (ii) Work station Software. As case of other multi user operating system, LAN operating system also facilitate the sharing of expensive resources such as printer, storage space etc. among all LAN users, provides security of data permits connections to other network.

There are various types of LAN operating systems for example Novel Netware, LAN server, omni met, PC Net, IBM PC LAN, Etherlik plus etc.

### **WIDE Area Network**

As the name suggest, WAN spread across countries and continents satellites being one of the transmission media.

A wide area network WAN is a network that links separate geographical location. A WAN can be a public system such as the Public Switched Telephone Network (PSTN) or one of the various packet switched services provided by the public telecommunication authorities. WANs can also use most other types of other types of circuit including satellite networks, ISDN, Value Added Networks (VANs/VADs).

The network can be a private system made up from the local telephone company or set up using public systems as virtual private network. A virtual private network is one which operates in the

same way as a private network but which uses public switched services for the transmission of information.

The main distinguishing feature between a LAN and WAN is that, the LAN is under the complete control of the owner, whereas the WAN needs the involvement of another authority like the telephone company. LANs are also able to handle very high data transfer rates at low cost because of the limited area covered. LANs have a lower error rate than WANs.

### **3.4 Switching Techniques**

In a WAN, two computing devices are not connected directly. A network of switching nodes provides a transfer path between the two devices. The process of transferring data blocks from one node to another is called data switching.

There are three switching techniques commonly employed and these are:

#### **1. Circuit Switching**

In circuit switching there is a dedicated communication path between the sending and receiving devices. The dedicated path is a connected sequence of links switching nodes. A conventional telephone network, where a dedicated path is set between the called party for the duration of a telephone call is an example of circuit switching.

Communication viz. circuit switching involves three steps-circuit establishment; data transfer; and circuit termination. Circuit switching is mainly used for voice telephone network, but is not that effective for data communication network, as channel capacities are not fully utilized, as data communication equipments do not generate data continuously.

#### **2. Message Switching**

Message switching is an alternative switching technique, where it is not necessary to establish a dedicated path between the sending and receiving devices. In message switching, the sending device appends the destination address to the message and passes to the network; the message is then passed through the network from one node to another till it reaches the intended destination. Each switching are electronic mails, computer files, telegrams and transaction queries and responses. A complete exchange may consist of several messages.

The basic disadvantage of message switching is the variable delay at intermediate switching nodes.

#### **3. Packet Switching**

Packet switching combines the advantages of message & circuit switching. Packet switching is functionally similar to message switching, in which data is transmitted in blocks, stored by the first switching node it meets in the network and it forwarded to the next and subsequent

downstream nodes until it reaches the destination. The length of data block is limited in packet switching network. Typical maximum length of packets is between 128 bytes to 4096 bytes. There are two approaches to packet switching:

- Datagram
- Virtual circuit

In datagram approach, each packet is treated independently and may follow a different path through the network. Packets may be reordered, dropped or delivered in wrong sequence. The communication protocols provide the error recovery sequencing of packets at the receiving device.

In virtual circuit approach, a fixed logical path through the network from the sender to the receiver is established before any packets are sent. This path remains unchanged for the duration of the session. This is quite like circuit switching, but no resources are reserved along the path. Packets are buffered at intermediate nodes awaiting transmission.

### **3.5 Network Devices**

#### **WAN Devices / Hardware**

The switching techniques utilized the routine technology of data transfer. Routing is responsible for searching a path between two computing devices that wish to communicate and for following the data packets on this path. Devices such as bridges, router and gateway provide this routing function.

#### **1. Bridges**

Bridges are used to connect two LANs that use identical LAN protocols over a wide area. The bridge acts as an address filter which picks up packets from one LAN that are identical for a destination on the another LAN and passes these packets on the network. Bridges operate at the data link layer (layer 2) of the OSI model. As all devices use the same protocols, the amount of processing required at the bridge is minimal. If the distance between the two LANs is large, the user would require two additional bridges at either end of the communication link.

#### **2. Routers**

Routers can be used to connect networks that may not be similar. Routers provide connectivity between two LANs or two WANs over large geographical distance. Routers operate at the network layer (layer 3) of the OSI model. All routers participate in routing protocols to access the network topology, and based on this information routers computes the best route from a sender to the receiver,

### **3. Gateways**

Gateways are used to connect to dissimilar LANs. The term gateway and routers are used interchangeably, though there is a subtle difference between the two. A gateway is required to convert data packets from one protocol format to another before forwarding it, as it connects two dissimilar networks.

### **4. What is X.25**

Towards the end of the 1960s, the common telecommunication carriers around the world recognized the need for data communication service that would be distinct from voice circuits. The plan was to put together a series of recommendations during the 1970s using ITTCC (International telegraph & telephone consultative committee) as the total standards body. This ITTCC recommendation series to define the new service was doubled the X series. During the 1970s some 60 to 70 recommendations had involved. The most famous of these is X.25, which defines an interface in to a particular regular data network that of a packet switched network.

### **Type of WIDE Area Network**

The essential purpose of WIDE Area network, regardless of the size or technology used is to link separate locations in order to move data around. A WAN allows these locations to access shared computer resources and provides the social infrastructure for developing wide spread distributed computing system.

We will now discuss the different types of WAN which are commonly used.

#### **1. Public Networks**

Public networks are those networks which are installed and run by the telecommunication authorities and are made available to any organization or individual who subscribes. Examples include Public Switched Telephone Networks (PSTN), Public Switched Data Network (PSDN), Value Added Service (VANs/ VADs) and the Integrated Service Digital Networks (ISDN). We would be discussing the main features of these services:

- **Public Switched Telephone Network (PSTN)**  
The features of the PSTN are its low speed, the analog nature of transmission, restricted bandwidth & its wide spread availability. As PSTN is designed for telephones, modems are required when it is used for data communication.
- **Public Switched Data Network (PSDN)**  
The term PSDN covers a number of technologies; all through currently it is limited to Public Packet Switch Networks available to the public. The main features of all PSDNs are their high label reliability and the high quality of the connection provided. They can support both high & low speeds at appropriate costs.
- **Value Added Services (VANs/ VADs)**  
In value added services, the provider of such services must process, store and manipulate the data that is carried on the network, that adds value to it. The technique can be used in specific

types of business in which it is advantageous to be able to share information with other companies in the same line.

- **Integrated Services Digital Network (ISDN)**

The ISDN is the networking concept providing for the integration of voice, video and data servicing using data service using digital transmission combining both circuits and packet switching techniques. The motivating force behind ISDN is that telephone networks around the world have been making a transition towards utilizing digital transmission facilities for many years.

## **2. Private Networks**

The basic technique used in all forms of private WAN is to use private (or more usually leased) circuits to link the locations to be served by the network. Between these fixed points the owner of the network has complete freedom to use the circuits in any way they want. They can use the circuit to carry large quantities of data or for high speed transmission.

Private WIDE area network can be built using what ever standard technology is available. The way private

## Unit 4 Presentation

- 4.1 Introduction Presentation
- 4.2 Working with the PowerPoint environment
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- 4.4 Advancing slides
- 4.5 Slide sections
- 4.6 Presenting a slide show

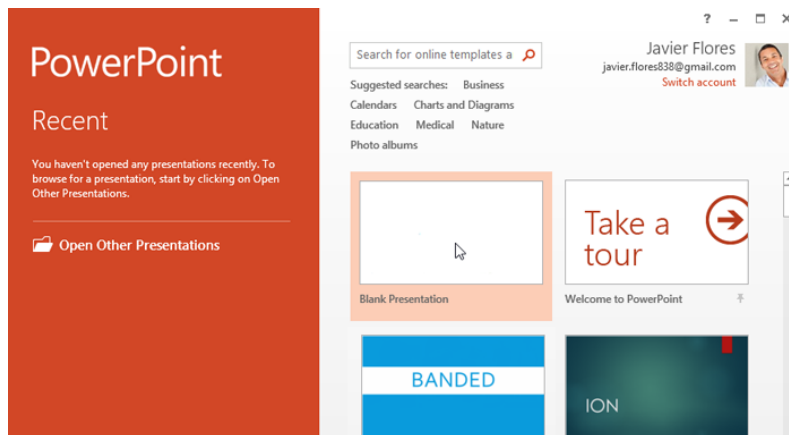
### 4.1 Introduction Presentation

PowerPoint 2013 is a **presentation software** that allows you to create dynamic slide presentations. Slideshows can include animation, narration, images, videos, and much more.

### Opening PowerPoint 2013

When you open PowerPoint 2013 for the first time, the **Start Screen** will appear. From here, you'll be able to create a **new presentation**, choose a **template**, and access your **recently edited presentations**.

1. From the **Start Screen**, locate and select **Blank Presentation**.



2. A **new presentation** will appear.

### Getting to know PowerPoint 2013

**PowerPoint 2013** is similar to PowerPoint 2010. If you've previously used PowerPoint 2010, PowerPoint 2013 should feel familiar. But if you are new to PowerPoint or have more experience with older versions, you should first take some time to become familiar with the **PowerPoint 2013 interface**.

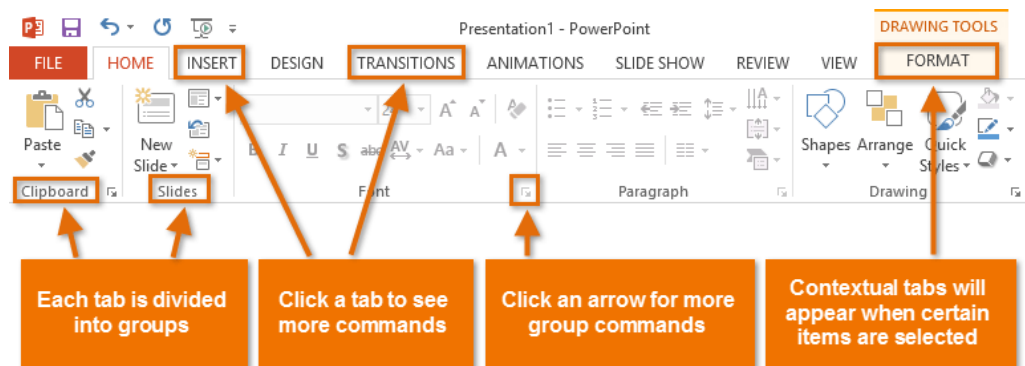
Click the buttons in the interactive below to become familiar with the PowerPoint 2013 interface.

## 4.2 Working with the PowerPoint environment

If you've previously used PowerPoint 2010 or 2007, PowerPoint 2013 will feel familiar. It continues to use features like the **Ribbon** and the **Quick Access toolbar**—where you will find commands to perform common tasks in PowerPoint—as well as **Backstage view**.

### The Ribbon

PowerPoint 2013 uses a **tabbed Ribbon system** instead of traditional menus. **The Ribbon** contains **multiple tabs**, each with several **groups of commands**. You will use these tabs to perform the most **common tasks** in PowerPoint.



### Exploring the Ribbon

You'll need to move between tabs to perform common tasks in PowerPoint. Knowing where to find the right command will make PowerPoint easier to use.

Click the arrows in the slideshow below to learn more about the different commands available within each tab on the Ribbon.

•

The **Home** tab gives you access to the most commonly used commands, including **copy and paste**, **formatting**, and the **New Slide** command. The Home tab is selected by default whenever you open PowerPoint.

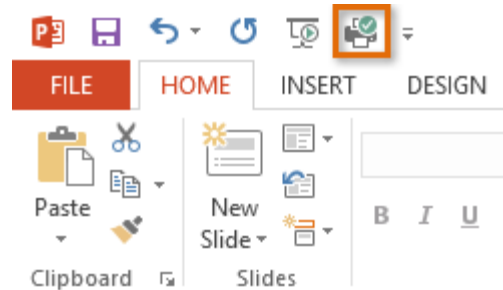
### To minimize and maximize the Ribbon:

The Ribbon is designed to respond to your current task, but you can choose to **minimize** it if you find that it takes up too much screen space.

1. Click the **Ribbon Display Options** arrow in the upper-right corner of the Ribbon.
2. Select the desired **minimizing option** from the drop-down menu:

### The Quick Access toolbar

Located just above the Ribbon, the **Quick Access toolbar** lets you access common commands no matter which tab is selected. By default, it includes the **Save**, **Undo**, **Repeat**, and **Start Presentation** commands. You can add other commands depending on your preference.



### To add commands to the Quick Access toolbar:

1. Click the **drop-down arrow** to the right of the **Quick Access toolbar**.
2. Select the **command** you want to add from the drop-down menu. To choose from more commands, select **More Commands**.
3. The command will be added to the Quick Access toolbar.

### The Ruler, guides, and gridlines

PowerPoint includes several tools to help organize and arrange content on your slides, including the **Ruler**, **guides**, and **gridlines**. These tools make it easier to **align objects** on your slides. Simply click the **check boxes** in the **Show** group on the **View** tab to show and hide these tools.

Simply click and drag to move the horizontal or vertical guides to a new position.

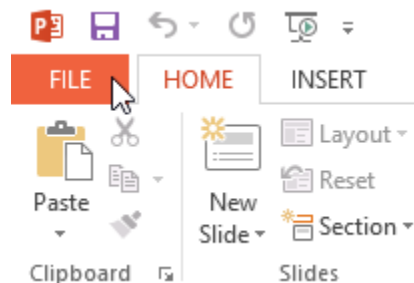
### Backstage view

**Backstage view** gives you various options for saving, opening, printing, and sharing your presentations.

### To access backstage view:

1. Click the **File** tab on the **Ribbon**.
2. **Backstage view** will appear.

Click the buttons in the interactive below to learn more about using backstage view.



## 4.3 Transitions

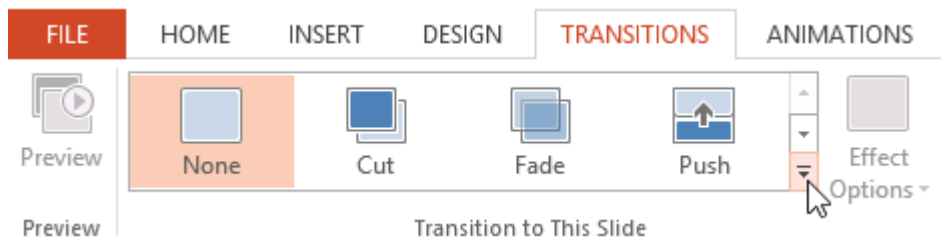
There are **three categories** of unique transitions to choose from, all of which can be found on the **Transitions** tab:

- **Subtle:** These are the most basic types of transitions. They use **simple animations** to move between slides.
- **Exciting:** These use more **complex animations** to transition between slides. While they're more visually interesting than **Subtle** transitions, adding too many can make your presentation look less professional. However, when used in moderation they can add a nice touch between important slides.
- **Dynamic Content:** If you're transitioning between two slides that use similar **slide layouts**, dynamic transitions will move only the **placeholders**, not the slides themselves. When used correctly, dynamic transitions can help **unify** your slides and add a further level of polish to your presentation.



### To apply a transition:

1. Select the **desired slide** from the **Slide Navigation** pane. This is the slide that will appear **after** the transition.
2. Click the **Transitions** tab, then locate the **Transition to This Slide** group. By default, **None** is applied to each slide.
3. Click the **More** drop-down arrow to display all transitions.



4. Click a **transition** to apply it to the selected slide. This will automatically preview the transition.

You can use the **Apply To All** command in the **Timing** group to apply the same transition to all slides in your presentation. Keep in mind that this will modify any other transitions you've applied.

Try applying a few different types of transitions to various slides in your presentation. You may find that some transitions work better than others, depending on the content of your slides.

### To preview a transition:

You can **preview** the transition for a selected slide at any time using either of these two methods:

- Click the **Preview** command on the **Transitions** tab.
- Click the **Play Animations** command in the **Slide Navigation** pane.

### Modifying transitions

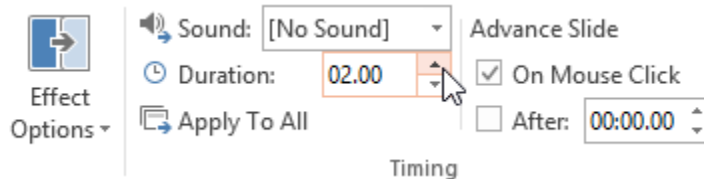
To modify the transition effect:

You can quickly customize the look of a transition by changing its **direction**.

1. Select the **slide** with the transition you want to modify.
  2. Click the **Effect Options** command, and choose the desired option. These options will vary depending on the selected transition.
  3. The transition will be **modified**, and a **preview** of the transition will appear.
- Some transitions do not allow you to modify the direction.

### To modify the transition duration:

1. Select the **slide** with the transition you want to modify.
2. In the **Duration** field in the **Timing** group, enter the **desired time** for the transition. In this example, we'll increase the time to two seconds—or 02.00—to make the transition **slower**.



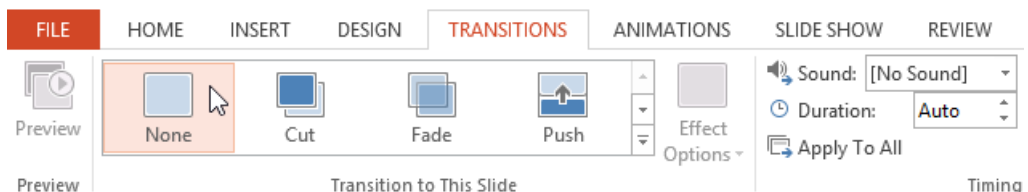
### To add sound:

1. Select the **slide** with the transition you want to modify.
2. Click the **Sound** drop-down menu in the **Timing** group.
3. Click a **sound** to apply it to the selected slide, then preview the transition to hear the sound.

Sounds are best used in moderation. Applying a sound between every slide could become overwhelming or even annoying to an audience when presenting your slide show.

### To remove a transition:

1. Select the **slide** with the transition you want to remove.
2. Choose **None** from the **Transition to This Slide** group. The transition will be removed.



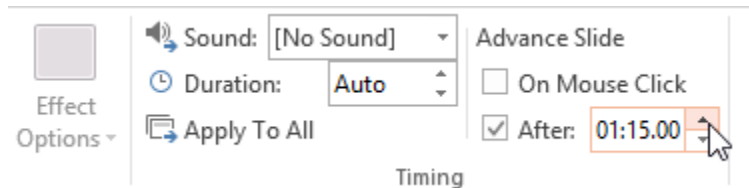
To remove transitions from **all slides**, apply the **None** transition to a slide, then click the **Apply to All** command.

## 4.4 Advancing slides

Normally, in Slide Show view you would advance to the next slide by clicking your mouse or by pressing the spacebar or arrow keys on your keyboard. The **Advance Slides** settings in the **Timing** group allows the presentation to advance **on its own** and display each slide for a specific amount of time. This feature is especially useful for **unattended presentations**, such as those at a trade show booth.

### To advance slides automatically:

1. Select the slide you want to modify.
2. Locate the **Timing** group on the **Transitions** tab. Under **Advance Slide**, uncheck the box next to **On Mouse Click**.
3. In the **After** field, enter the amount of time you want to display the slide. In this example, we will advance the slide automatically after 1 minute and 15 seconds, or 01:15:00.



4. Select another slide and repeat the process until all the slides have the desired timing. You can also click the **Apply to All** command to apply the same timing to all slides.

If you need to advance to the next slide before an automatic transition, you can always click the mouse or press the spacebar to advance the slides as normal.

### About slide views

PowerPoint includes several different **slide views**, which are all useful for various tasks. The **slide view commands** are located in the bottom-right of the PowerPoint window. There are four main slide views:

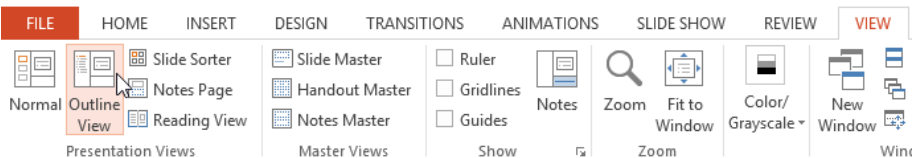
- **Normal view:** This is the **default** view, where you create and edit slides. You can also move slides in the slide navigation pane on the left.
- **Slide sorter:** In this view, you'll see a **thumbnail version** of each slide. You can drag and drop slides to reorder them quickly.
- **Reading view:** This view fills the PowerPoint window with a **preview** of your presentation. It includes easily accessible **navigation buttons** at the bottom-right.
- **Play slide show:** This is the view you'll use to **present** to an audience. This command will begin the presentation from the **current slide**. You can also press **F5** on your keyboard to start from the beginning. A menu will appear when you hover the mouse in the bottom-left corner. These commands allow you to navigate through the slides and access other features, such as the **pen** and **highlighter**.

## Outline view

**Outline view** shows your slide text in **outline** form. This allows you to quickly edit your slide text and view the content of multiple slides at once. You could use this layout to review the organization of your slide show and prepare to deliver your presentation.

### To view an outline:

1. From the **View** tab, click the **Outline View** command.



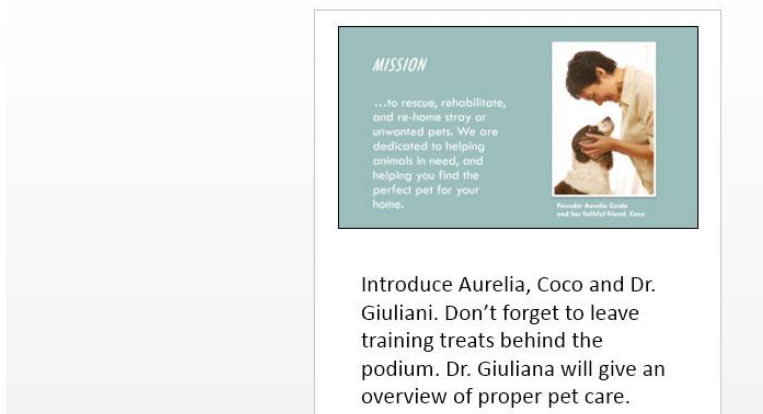
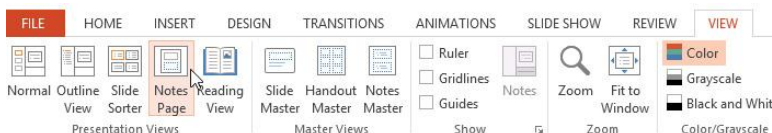
2. An **outline** of your slide text will appear in the slide navigation pane.
3. You can type directly in the outline to make changes to your slide text.

**Slide notes:- You can add notes to your slides from the Notes pane. Often called speaker notes, they can help you deliver or prepare for your presentation.**

### To add notes:

1. Click the **Notes** command at the bottom of the screen to open the **Notes** pane.
2. Click and drag the **edge** of the pane to **resize** it if desired.
3. Click the **Notes** pane, and begin typing to add notes.

You can also access **Notes Page** view to edit and review your notes. Just click the **Notes Page** command from the **View** tab. From there, you can type notes in the **text box** below each slide.



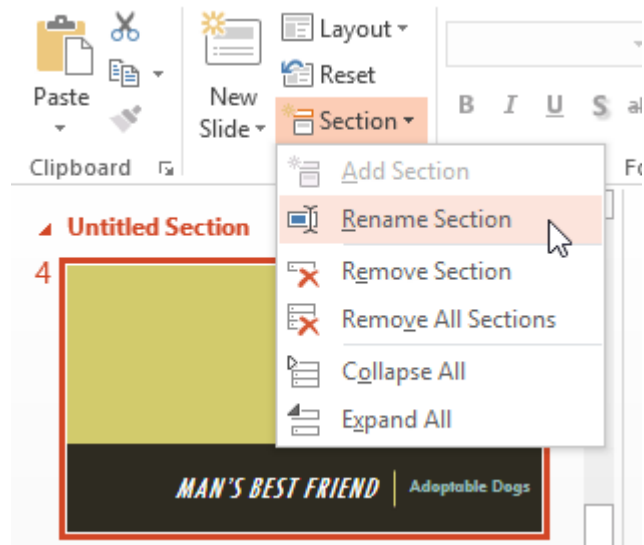
## 4.5 Slide sections

If you have a lot of slides, you can organize them into **sections** to make your presentation easier to navigate. Sections can be collapsed or expanded in the slide navigation pane and named for easy reference.

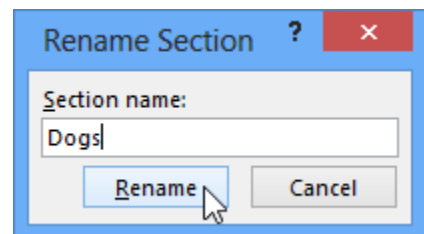
### To create slide sections:

In our example, we will add two sections: one for dogs that are available for adoption, and another for cats and other pets.

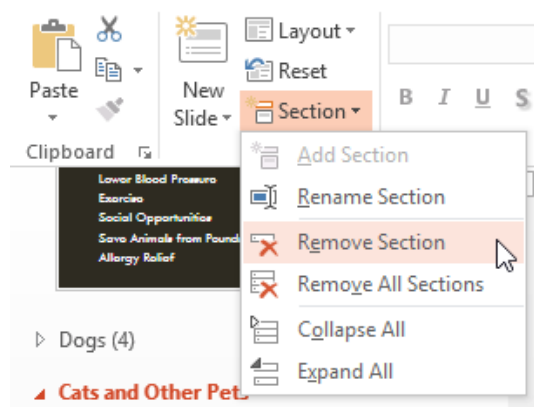
1. Select the **slide** you want to begin a section.
2. From the **Home** tab, click the **Section** command, then choose **Add Section** from the drop-down menu.
3. An **Untitled Section** will appear in the slide navigation pane.
4. To **rename** the section, click the **Section** command, then choose **Rename Section** from the drop-down menu.



5. Type the new section name in the dialog box, then click **Rename**.
6. Repeat to add as many sections as you need.
7. In the slide navigation pane, click the **arrow** next to a section name to **collapse** or **expand** it.



To **remove** a section, click the **Section** command, then click **Remove Section**. You can also click **RemoveAll Sections** to remove all sections from your slides.



## 4.6 Presenting a slide show

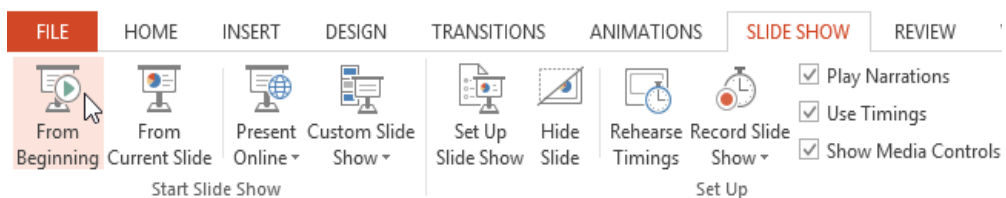
Before you present your slide show, you'll need to think about the type of **equipment** that will be available for your presentation. Many presenters use **projectors** during presentations, so you might want to consider using one as well. This allows you to control and preview slides on one monitor while presenting them to an audience on another screen.

### To start a slide show:

- Click the **Start From Beginning** command on the Quick Access toolbar, or press the **F5** key at the top of your keyboard. The presentation will appear in full-screen mode.

You can also click the **Play Slide Show** command at the bottom of the PowerPoint window to begin a presentation from the current slide.

Click the **Slide Show** tab on the Ribbon to access even more options. From here, you can start the presentation **from the current slide** and access **advanced presentation options**.



### To advance and reverse slides:

You can advance to the next slide by **clicking your mouse** or pressing the **spacebar** on your keyboard. Alternatively, you can use **arrow keys** on your keyboard to move forward or backward through the presentation.

You can also hover your mouse over the bottom-left and click the **arrows** to move forward or backward.

### To stop a slide show:

You can exit presentation mode by clicking the **Esc** key on your keyboard.

Alternatively, you can click the **Slide Show Options** button in the bottom-left and select **End Show**.

The presentation will also end after the **last slide**. You can click the mouse or press the spacebar to return to Normal view.

## Unit 5 Drawing and Modifying Object

- 5.1 Presentation tools and features
- 5.2 Slide options
- 5.3 Animation Effect
- 5.4 Working with animations
- 5.5 The Effect Options dialog box

### 5.1 Presentation tools and features

PowerPoint provides convenient tools you can use while presenting your slide show. For example, you can change your mouse pointer to a **pen** or **highlighter** to draw attention to items in your slides. In addition, you can **jump around** to slides in your presentation or access other programs from your **taskbar** if needed.

#### To access drawing tools:

Your mouse pointer can act as **pen** or **highlighter** to draw attention to items in your slides.

1. Locate and select the **Pen Tools** button in the bottom-left corner.
2. Select **Pen** or **Highlighter** based on your preference.
3. Click and drag the mouse to **mark** your slides. You can also press **Ctrl+P** on your keyboard to access the pen tool while presenting your slide show.

You can also use the **laser pointer** feature to draw attention to certain parts of your slide. Unlike the pen and highlighter, the laser pointer will not leave markings on your slides. To use the laser pointer, select it from the Pen Tools, or press and hold the **Ctrl** key and the left mouse button.

#### To erase ink markings:

1. Locate and select the **Pen Tools** button in the bottom-left corner.
2. Select **Eraser** to erase individual ink markings, or select **Erase All Ink on Slide** to erase all markings.

When you end a slide show, you'll also have the option to **Keep** or **Discard** any ink annotations made during your presentation. If you keep ink markings, they'll appear as **objects** on your slides in Normal view.

#### To skip to a nonadjacent slide:

You can jump to slides **out of order** if needed.

1. Locate and select the **See All Slides** button in the bottom-left corner.
2. **Thumbnail versions** of each slide will appear. Select the slide you want to jump to.
3. The selected slide will appear.

#### To show the taskbar:

Sometimes you may need to access the Internet or other files and programs on your computer during your presentation. PowerPoint allows you to access your **taskbar** without ending the presentation.

1. Locate and select the **Slide Options button** in the bottom-left corner.

2. Select **Screen**, then click **Show Taskbar**.
3. Your **taskbar** will appear. Choose a program you want to open, such as a web browser. Click the PowerPoint icon to return to the presentation.

## 5.2 Slide options

You can also access any of the menu items above by **right-clicking** anywhere on the screen during your slide show.

### Presenter view

If you're presenting your slide show with a second display—like a projector—you can use **Presenter view**. Presenter view gives you access to a special set of controls on your screen that the audience won't see, allowing you to easily reference **slide notes**, preview the **upcoming slide**, and much more.

#### To access Presenter view:

Start your slide show as you normally would, then click the **Slide Options** button and select **Presenter View**. Alternatively, you can press **Alt+F5** on your keyboard to start the slide show in Presenter view.

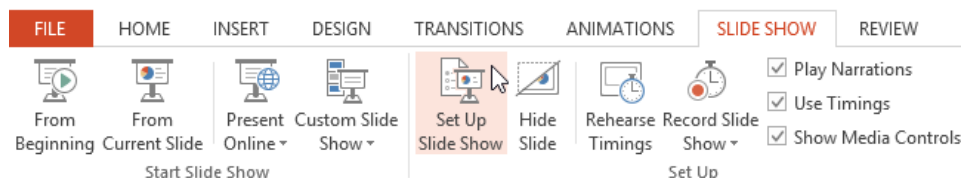
Click the buttons in the interactive below to learn more about using Presenter view.

### Slide show setup options

PowerPoint has various options for setting up and playing a slide show. For example, you can set up an unattended presentation that can be displayed at a kiosk and make your slide show repeat with continuous looping.

#### To access slide show setup options:

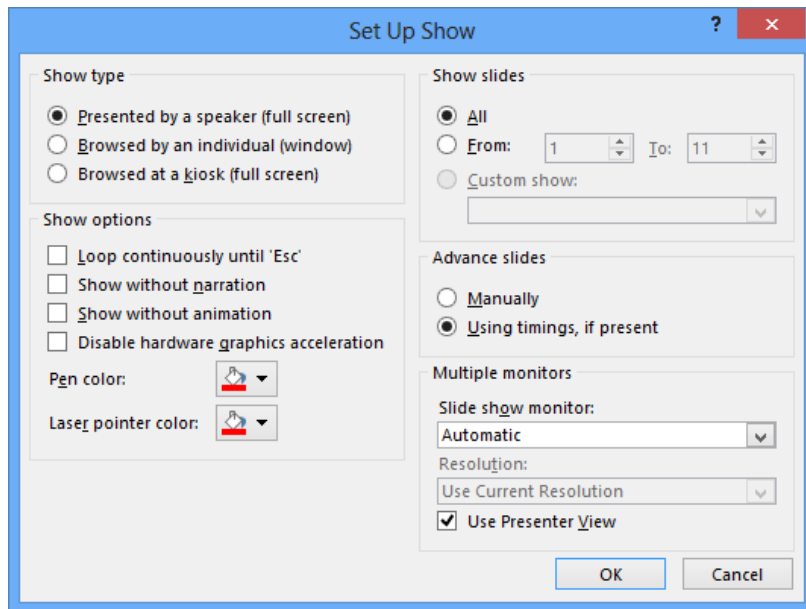
1. Select the **Slide Show** tab, then click the **Set Up Slide Show** command.



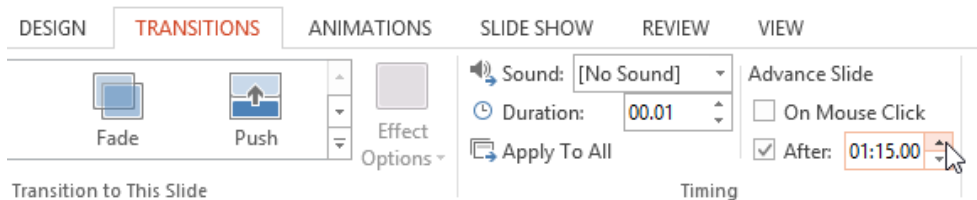
2. The **Set Up Show** dialog box will appear. From here, you can select the desired options for your presentation.

Click the buttons in the interactive below to learn about various options for setting up and playing a slide show.





To advance slides automatically, you'll need to customize the slide timing on the **Transitions** tab. Review our lesson on [Applying Transitions](#) to learn how.



### 5.3 Animation Effect

There are several animation effects you can choose from, and they are organized into four types:

- **Entrance:** These control how the object enters the slide. For example, with the **Bounce** animation the object will "fall" onto the slide and then bounce several times.
- **Emphasis:** These animations occur while the object is on the slide, often triggered by a **mouse click**. For example, you can set an object to **spin** when you click the mouse.
- **Exit:** These control how the object exits the slide. For example, with the **Fade** animation the object will simply fade away.
- **Motion Paths:** These are similar to **Emphasis** effects, except the object moves within the slide along a predetermined path, like a **circle**.

### To apply an animation to an object:

1. Select the object you want to animate.
2. On the **Animations** tab, click the More drop-down arrow in the **Animation** group.
3. A drop-down menu of animation effects will appear. Select the desired effect.
4. The effect will apply to the object. The object will have a small **number** next to it to show that it has an animation. In the Slide pane, a **star** symbol also will appear next to the slide.

At the bottom of the menu, you can access even more effects.



### Effect options

Some effects will have **options** you can change. For example, with the **Fly In** effect you can control **which direction** the object comes from. These options can be accessed from the **Effect Options** command in the Animation group.

### To remove an animation

1. Select the small **number** located next to the animated object.
2. Press the **Delete** key. The animation will be deleted.

## 5.4 Working with animations

To add multiple animations to an object:

If you select a new animation from the the menu in the Animation group, it will **replace the object's current animation**. However, you'll sometimes want to place **more than one animation** on an object, like an **Entrance** and an **Exit** effect. To do this, you'll need to use the **Add Animation** command, which will allow you to keep your current animations while adding new ones.

1. Select an object.
2. Click the **Animations** tab.
3. In the **Advanced Animation** group, click the **Add Animation** command to view the available animations.
4. Select the desired animation effect.
5. If the object has more than one effect, it will have a different **number** for each effect. The numbers indicate the **order** in which the effects will occur.

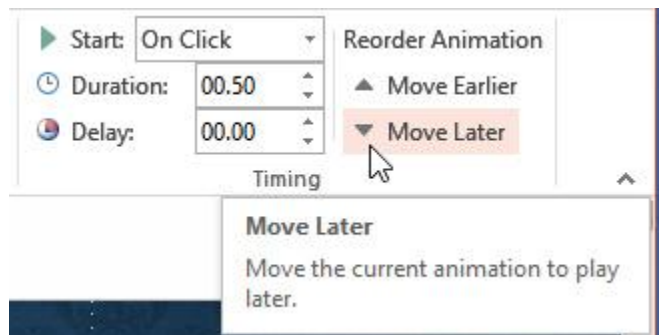
### To copy animations with the Animation Painter:

In some cases, you may want to apply the same effects to more than one object. You can do this by **copying** the effects from one object to another using the **Animation Painter**. In our example, we want text to appear on our banner shape, so we've added a text box on top of the banner. We'd like the text to appear using the same effects we used on the banner, so we'll use the Animation Painter to copy the effects from the banner to the text box.

1. Click the **object** that has the **effects** you want to copy. In our example, we'll click our banner shape.
2. From the **Animations** tab, click the **Animation Painter** command.
3. Click the **object** you want to copy the effects to. The effects are applied to the object. In our example, the effects from the shape are applied to the text box.

### To reorder the animations:

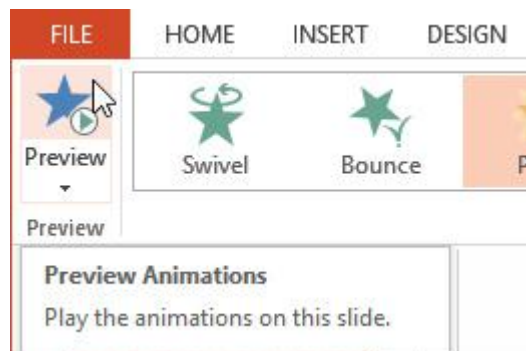
1. Select the **number** of the effect you want to change.
2. From the **Animations** tab, click the **Move Earlier** or **Move Later** commands to change the ordering.



### To preview animations:

Any animation effects you have applied will show up when you play the slide show. However, you can also quickly **preview** the animations for the current slide without viewing the slide show.

1. Navigate to the **slide** you want to preview.
2. From the **Animations** tab, click the **Preview** command. The animations for the current slide will play.



### The Animation Pane

The **Animation Pane** allows you to view and manage all of the effects that are on the current slide. You can **modify** and **reorder** effects directly from the Animation Pane, which is especially useful when you have several effects.

### To open the Animation Pane:

1. From the **Animations** tab, click the **Animation Pane** command.
2. The Animation Pane will open on the right side of the window. It will show all of the effects for the current slide in the order in which they will appear.

If you have several animated objects, it may help to rename the objects before reordering them in the Animation Pane. You can rename them in the **Selection Pane**. To open the Selection Pane, click an **object**, then from the **Format** tab click **Selection Pane**. Double-click the name of an object to rename it.

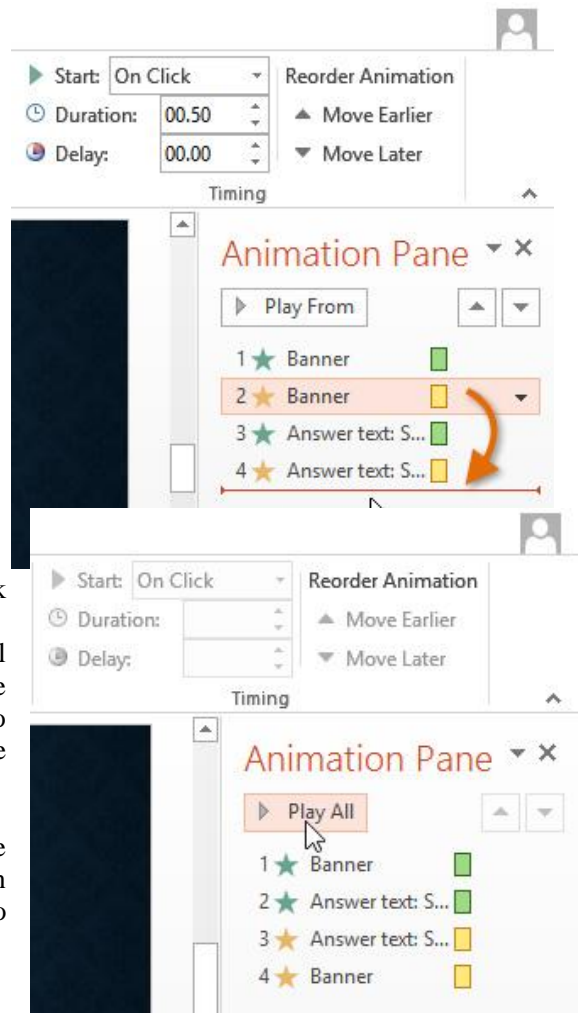
#### To reorder effects from the Animation Pane:

1. On the **Animation Pane**, click and drag an effect up or down.
2. The effects will reorder themselves.

#### To preview effects from the Animation Pane:

1. From the **Animation Pane**, click the **Play** button.
2. The effects for the current slide will play. On the right side of the Animation Pane, you will be able to see a **timeline** that shows the progress through each effect.

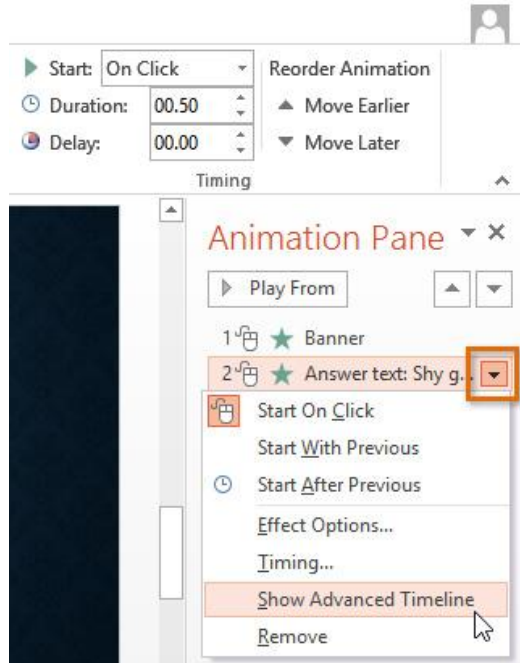
If the timeline is not visible, click the drop-down arrow for an effect, then select **Show Advanced Timeline**. To change an effect's start option:



By default, an effect starts playing when you click the mouse during a slide show. If you have multiple effects, you will need to click multiple times to start each effect individually. However, by changing the **start option** for each effect, you can have effects that automatically play **at the same time** or **one after the other**

1. From the **Animation Pane**, select an effect. A drop-down arrow will appear next to the effect.
2. Click the drop-down arrow. You will see three **start options**:
  - **Start on Click:** This will start the effect when the mouse is clicked.
  - **Start With Previous:** This will start the effect at the same time as the previous effect.
  - **Start After Previous:** This will start the effect when the previous effect ends.
3. Select the desired start option.

When you **preview** the animations, all of the effects will play through automatically. To test effects that are set to **Start on Click**, you will need to play the slide show.

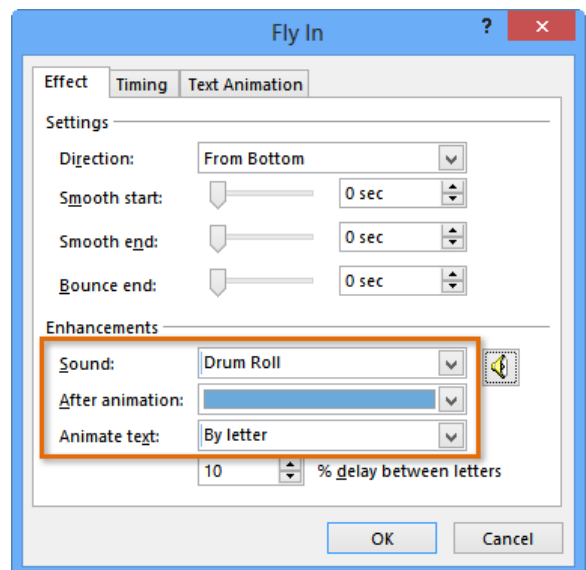


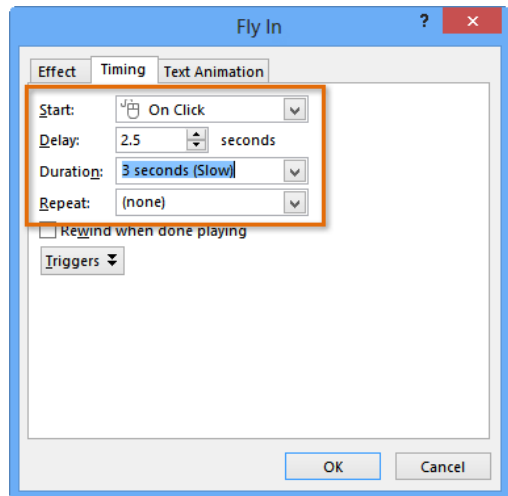
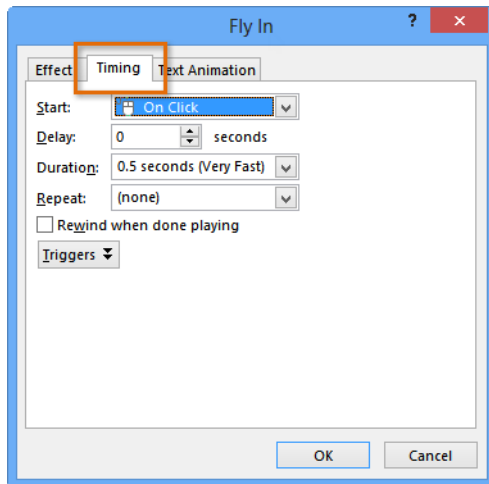
## 5.5 The Effect Options dialog box

From the Animation Pane, you can access the **Effect Options** dialog box, which contains more advanced options you can use to fine tune your animations.

### To open the Effect Options dialog box:

1. From the **Animation Pane**, select an effect. A drop-down arrow will appear next to the effect.
2. Click the drop-down arrow, then select **Effect Options**.
3. The Effect Options dialog box will appear. From here, you can add various **enhancements** to the effect:
  - **Sound:** Adds a sound effect to the animation.
  - **After animation:** Changes the color or hides the object after the animation is over
  - **Animate text:** Allows you to animate text **all at once**, **one word at a time**, or **one letter at a time**

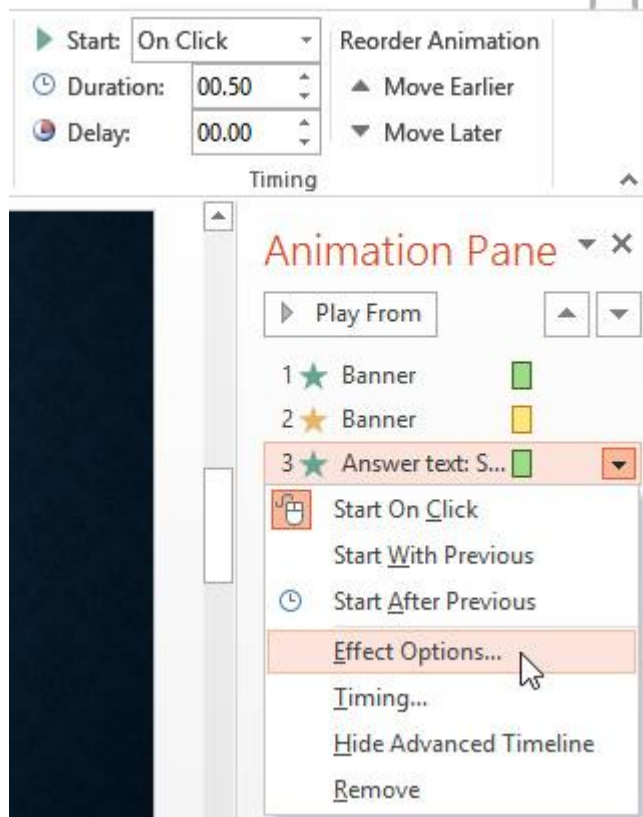




Some effects have **additional options** you can change. These will vary depending on which effect you have selected.

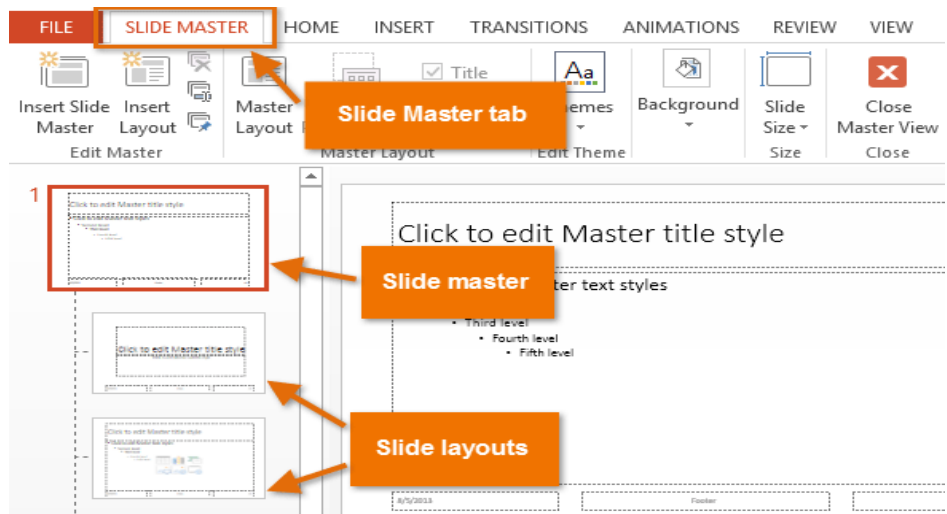
#### To change the effect timing:

1. From the **Effect Options** dialog box, select the **Timing** tab.
2. From here, you can add a **delay** before the effect starts, change the **duration** of the effect, and control whether or not the effect **repeats**.



## Unit 6 Creating a Multimedia Presentation

- 6.1 What is Slide Master View
- 6.2 Using Slide Master view
- 6.3 Customizing slide layouts
- 6.4 Customizing text formatting
- 6.5 Creating new slide layouts
- 6.6 To save a theme



### 6.1 What is Slide Master view?

**Slide Master view** is a special feature in PowerPoint that allows you to quickly modify the slides and slide layouts in your presentation. From there, you can edit the **slide master**, which will affect **every slide** in the presentation. You can also modify individual **slide layouts**, which will change any slides using those layouts.

For example, let's say you find a theme you like but you don't like the slide layouts. You could use Slide Master view to customize the layouts exactly the way you want them to look.

In Slide Master view, the **Slide Master** tab will appear first on the Ribbon, but you'll still be able to access commands on different tabs as normal.

### 6.2 Using Slide Master view

Whether you're making **significant changes** to your slides or just a few **small tweaks**, Slide Master view can help you create a consistent, professional presentation without a lot of effort. You could use Slide Master view to change just about anything in your presentation, but here are some of its most common uses:

- **Modify backgrounds:** Slide Master view makes it easy to customize the **background** for all of your slides at the same time. For example, you could add a watermark or logo to each slide in your presentation, or you could modify the background graphics of an existing PowerPoint theme.



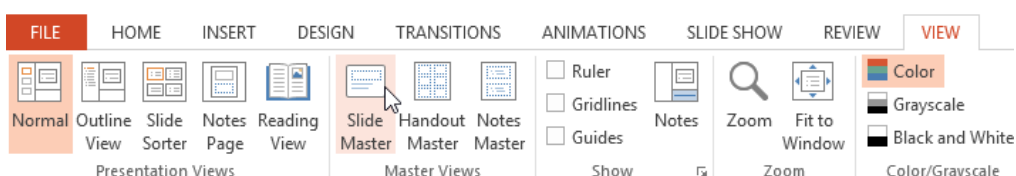
- **Rearrange placeholders:** If you find that you often rearrange the placeholders on each slide, you can save time by rearranging them in Slide Master view instead. When you adjust one of the layouts in Slide Master view, all of the slides with that layout will change.
- **Customize text formatting:** Rather than changing the text color on each slide individually, you could use the Slide Master to change the text color on all slides at once.
- **Create unique slide layouts:** If you want to create a presentation that looks different from regular PowerPoint themes, you could use Slide Master view to create your own layouts. Custom layouts can include your own **background graphics** and **placeholders**.

Some overall presentation changes—like customizing the **theme fonts** and **theme colors**—can be made quickly from the Design tab. Review our lesson on **Modifying Themes** to learn more.

### To make changes to all slides:

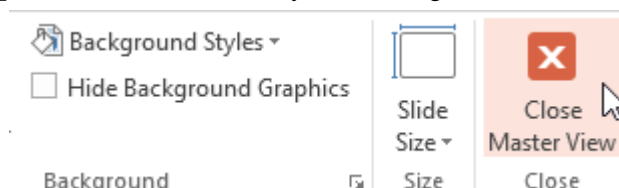
If you want to change something on all slides of your presentation, you can edit the Slide Master. In our example, we'll add a **logo** to every slide.

1. Select the **View** tab, then click the **Slide Master** command.



2. The presentation will switch to **Slide Master view**, and the **Slide Master** tab will be selected on the Ribbon.
3. In the left navigation pane, scroll up and select the **first slide**. This is the **slide master**.
4. Use the desired **tabs** on the Ribbon to make changes to the Slide Master. In our example, we'll **insert a picture** in the upper-left corner of the slide.
5. **Move, resize, or delete** other slide objects as needed. In our example, we'll resize the **background graphic** to fit below our newly inserted logo.

6. When you're finished, click the **Close Master View** command on the **Slide Master** tab.



7. The change will appear on all slides of the presentation.

When you make a change to the Slide Master, it's a good idea to review your presentation to see how it affects each slide. You may find that some of your slides don't look exactly right. On the next page, we'll show you how to fix this by customizing individual slide layouts.



If you're inserting a **background graphic**, you may want to send it **behind** all other objects on the slide. Right-click the object, select **Send to Back**, then click **Send to Back**. Review our lesson on [Arranging Objects](#) to learn more.

**Now it's your turn!** Try adding or moving a shape on the Slide Master and see how it affects the rest of your slides.

### 6.3 Customizing slide layouts

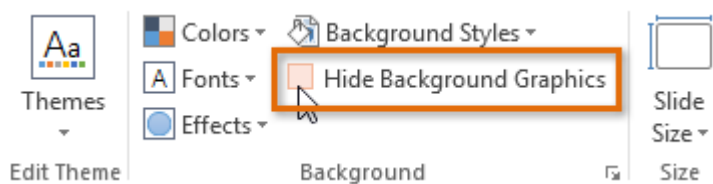
You can use Slide Master view to modify any **slide layout** in your presentation. It's easy to make small tweaks like adjusting background graphics and more significant changes like rearranging or deleting placeholders. Unlike the Slide Master, changes to a slide layout will only be applied to slides using that layout in your presentation.

#### To customize an existing slide layout:

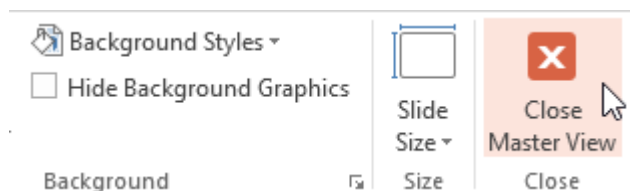
In our example, our newly added logo overlaps a background graphic in the **Content with Caption Layout**. We'll customize this layout to make room for the logo.

1. Navigate to **Slide Master** view.
2. Locate and select the desired layout in the left navigation pane. You can hover the mouse over each layout to see which slides are currently using that layout in the presentation.
3. In some layouts, the background graphics may be hidden. To show the graphics, uncheck the box next to **Hide Background Graphics**.

4. Add, move, or delete any **objects** as desired. In our example, we'll move the red arrow to better show our new logo.



5. If you want to change the arrangement of the placeholders, you can move, resize, or delete any of them. In our example, we'll move our placeholders down to align with the red arrow.



6. When you're finished, click the **Close Master View** command on the **Slide Master** tab.
7. All slides using the layout will be updated.

To add a new slide with the customized layout, click the **bottom half** of the **New Slide** command, then select the desired layout.

You can also move placeholders on the **Slide Master**, which will move the placeholders on multiple slide layouts at the same time. However, some slide layouts may still need to be adjusted manually.

## 6.4 Customizing text formatting

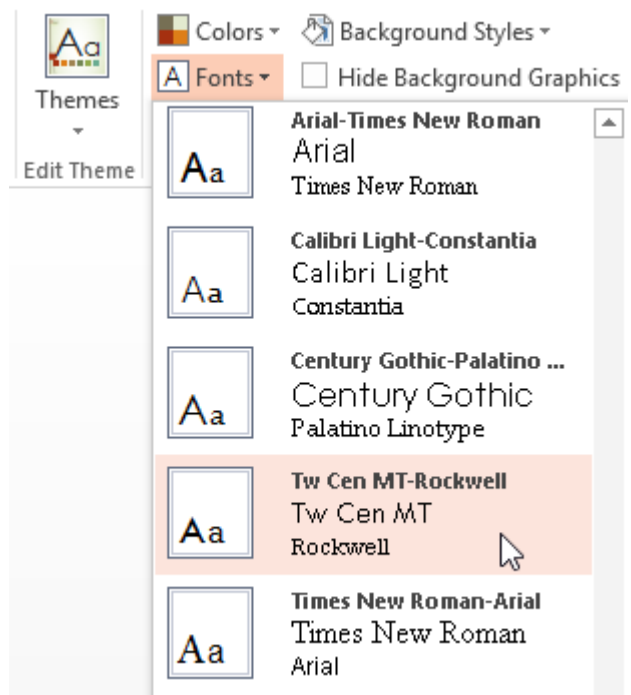
You can also customize the **text formatting** from Slide Master view, including the **font**, **text size**, **color**, and **alignment**. For example, if you wanted to change the font for every **title placeholder** in your presentation, you could modify the **master title style** on the Slide Master.

Each title placeholder is **connected** to the master title style on the Slide Master. As you can see in the example below, modifying the font on the Slide Master changed the title font on each slide.

Rather than customizing individual placeholders, you could change the **theme fonts** for a presentation. From the **Slide Master** tab, click the **Fonts** command in the **Background** group, then select the desired fonts.

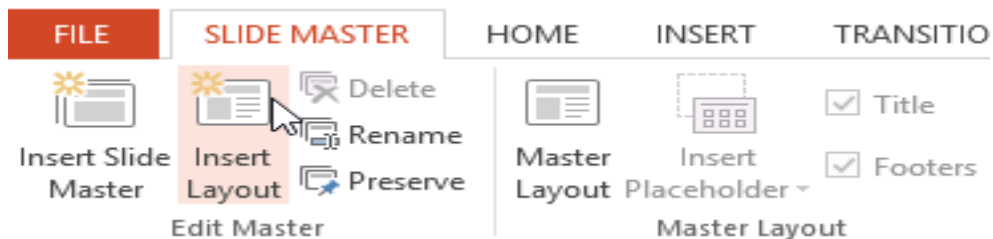
## 6.5 Creating new slide layouts

One of the most powerful features of Slide Master view is the option to create **new slide layouts**. This is an easy way to add interesting and unique slide layouts to an existing theme. You could even use this feature to design an entirely **new theme**, as in the example below.



### To insert a new slide layout:

1. Navigate to **Slide Master** view.
2. From the **Slide Master** tab, click the **Insert Layout** command.



3. A new slide layout will appear.
4. The layout will include **Title** and **Footer** placeholders by default. Click the **Title** and **Footers** boxes in the **Master Layout** group to toggle these placeholders on and off.
5. Click the **bottom half** of the **Insert Placeholder** command, then select the desired placeholder type. We recommend using the **Content** placeholder most of the time because it can be used for any type of slide content.
6. Click and drag to draw the placeholder on the slide. You can add more placeholders if desired.
7. Using the other tabs on the Ribbon, you can also add background graphics, shapes, or pictures to the slide layout.

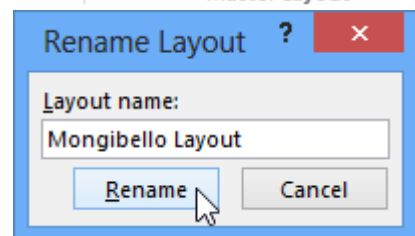
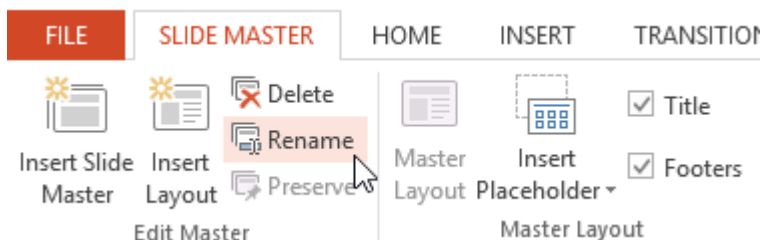
### To rename a custom layout:

You'll want to give your custom layout a **unique name** so it will be easy to find.

1. Navigate to **Slide Master** view.
2. Select the desired layout, then click

the **Rename** command.

3. A dialog box will appear. Type the desired name, then click **Rename**.



### 6.6 To save a theme:

- Select the **Slide Master** tab, click the **Themes** command, then select **Save Current Theme** from the drop-down menu.

If you're not in Slide Master view, you can save the theme from the **Design** tab. Just click the drop-down arrow in the **Themes** group, then select **Save Current Theme**.

## Unit 7 Database Applications

### 7.3 Database Overview

### 7.4 Introduction to MS Access

### 7.5 Database and Relational Database

## 7.6 Database Overview

A database is basically a collection of data or pieces of information. Whether you know it or not, you probably use databases all of the time.

## 7.7 Introduction to MS Access

### MS Access

Microsoft Access is a Relational Database Management System (RDBMS), designed primarily for home or small business usage.

Access has traditionally been known as a *desktop* database system because its functions are intended to be run from a single computer (as opposed to a *server* database application where the application is installed on a server, then accessed remotely from multiple client machines).

Having said this, Microsoft Access has included a web solution (as well as its desktop solution) since 2010, where it is integrated with SharePoint and, since 2013, SQL Server. This tutorial focuses on the desktop solution.

Microsoft Access (or MS Access) is a software package that you install just like any other software package, and is bundled as part of the Microsoft Office suite.

### Access versus Excel

You may be wondering what the benefits of using Access are compared with using an Excel spreadsheet. Well, it really depends on what you want to do with the data that you're storing and how much data you intend to store.

Excel may be fine if you've only got a small amount of data, and if you don't have many attributes against each piece of data. It may be fine if you don't have much in the way of relational data across multiple worksheets. Once you start storing many attributes against each piece of data, and perhaps you find yourself repeating information across multiple worksheets, then it's time to start using Access (or another database system if you prefer).

Another important reason for using Access over Excel is, if you need to generate a lot of queries and reports. Access is much better suited for doing this compared to Excel.

### Access File Extensions

When you create (and save) a database in Microsoft Access, the database is saved with a *.accdb* extension. This is the file extension you will use the most when developing Access databases. Older Access databases used an *.mdb* extension or sometimes a *.mde* extension, but

in 2007, Microsoft started to phase these out in favor of the *.accdb* extension. If you're unable to open an older database, you may need to convert to *.accdb* first using a pre-2013 version of Access.

### Download Microsoft Access

If you don't currently have Microsoft Access installed on your computer, you can download it from the [official MS Access website](#).

### Access Versions

This tutorial uses Microsoft Access 2013. If you're using a different version, the screenshots might look a little different. Generally, most of the basic functions remain consistent between versions of Access so you should be able to follow along without any problems.

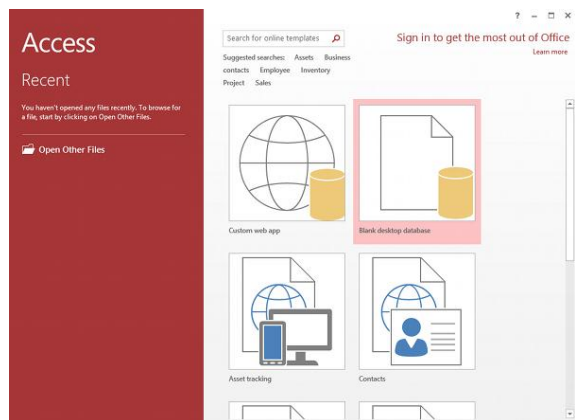
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## Create the Database

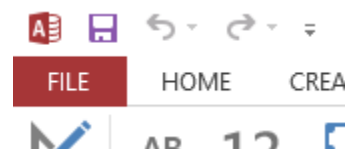
The first step to creating a database is to, well, create the database! We will create a blank database first. Then throughout the rest of the tutorial, we'll make additions to it so that it suits the needs of our favorite space travel company.

Creating a database in Microsoft Access is as easy as creating a Word document! This lesson demonstrates how to create a database in MS Access.

1. You may notice that, when you first start Microsoft Access 2013, you see the following screen. In this case, you can simply select Blank desktop database (then skip to Step 3).



If you already have Access open, you can go to the File menu:

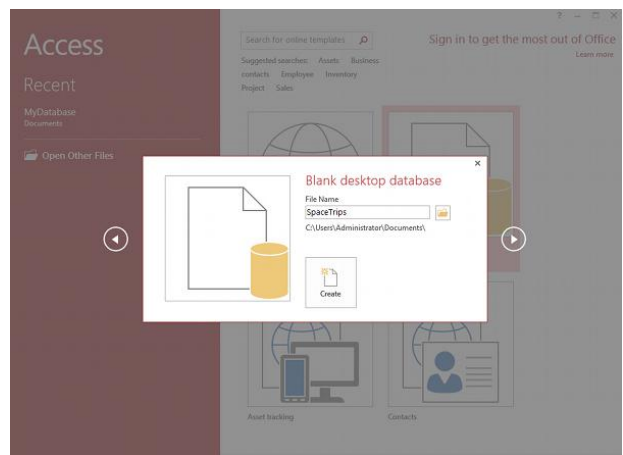
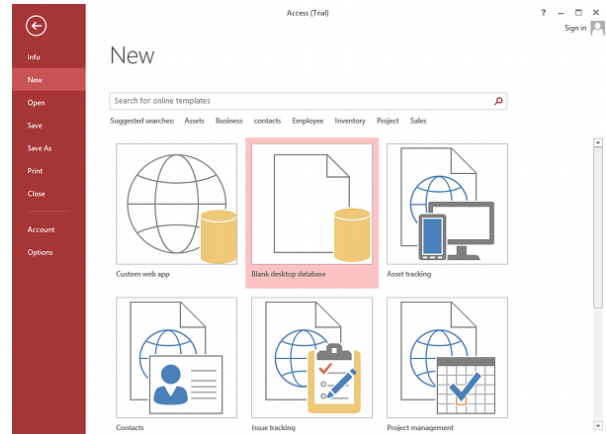


2. Choose Blank desktop database. (Skip this step if you already chose Blank desktop database at step one). You also have other options, but we'll just use a blank database here:

3. Choose a name and click Create. Let's call it Space Trips. You can either use the default location or click the folder icon to change the location:

## Your New Database

Once you've completed the above steps, you should see a blank database, like this: We know this database is blank because it only contains one table (called Table1) and that table only has one column (called ID). So we need to add some more columns to the



## Unit 8 Tables

### 8.1 Table Basics and Design

### 8.2 Creating Relationship

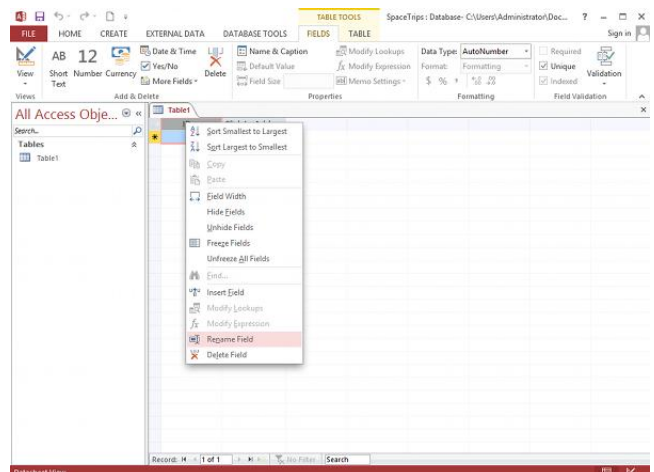
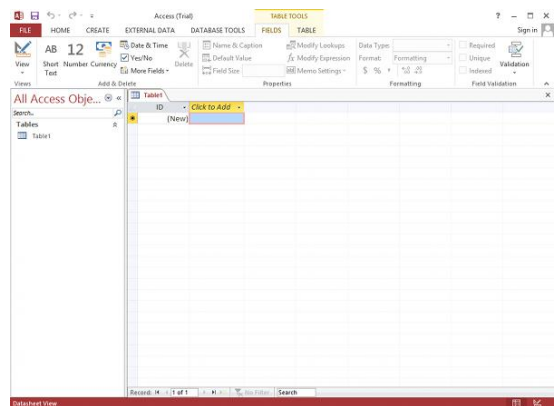
## 8 Table Basics and Design

### Create a Table in Microsoft Access 2013

With database management systems, you need to create your tables before you can enter data. Microsoft Access makes creating tables extremely easy. In fact, when you create a database, Access creates your first table for you (and calls it Table1).

Normally when you need to create a new table, you'll select CREATE > Table from the Ribbon toolbar. But we can do that later. For now Access has already created our first table, so all we need to do is modify that table so that it suits our needs.

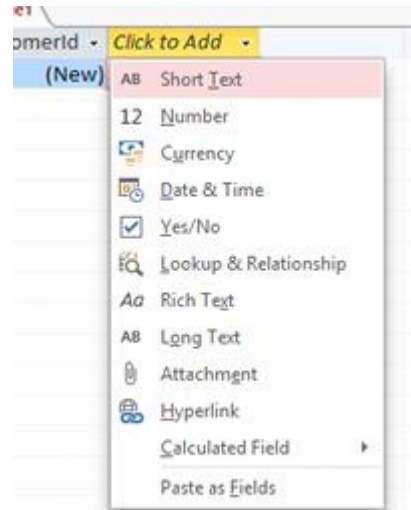
Using our blank database, we are going to rename Table1 to *Customers*. This table will have 4



columns: *CustomerId*, *FirstName*, *LastName*, and *DateCreated*.

1. Rename the ID field to CustomerId. To do this, Right-click on the ID column and select Rename Field. Enter CustomerId when prompted:
2. On the next field, click on Click to Add (unless Access has already opened the menu for you) and select Short Text:

3. At this point, Access will conveniently highlight/select the field name (currently Field1) so that you can name the field. Call it FirstName:
4. Do the same again for the next field (LastName) and select data type Short Text.
5. In the next field, select the Date & Time data type and name the field DateCreated

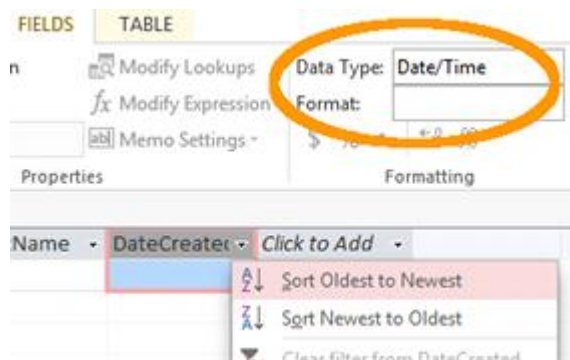


What we just did was create the column names and specify the type of data that can be entered into them. Restricting the data type for each column is very important and helps maintain *data integrity*. It can ensure that the user enters the data in the intended format. It can also guard against accidents like for example, inadvertently entering an email address into a field for storing the current date.

You might notice that now when you click on the field names, you can't see or change their data types. Instead, if you click on the inverted triangle within a field, you see a different menu of options (eg, Sort Oldest to Newest etc) depending on the field's data type. This shows that the field is ready for data - once you have data, you can sort it using this menu.

Don't worry if you accidentally entered the wrong data type. You can change the datatype in the Ribbon toolbar by adjusting the data type under the Data Type dropdown (top right area of the toolbar). If you can't see this option in the toolbar be sure to select the FIELDS tab first:

We have just created a database table. We did this in Datasheet view. Next we will see how it appears in Design view.





## Design View in Microsoft Access 2013

So we've just created a table. We did that in Datasheet view. We can also view the table in Design view.

### What Is Design View?

*Design view* enables you to design and set up your database (kind of a "behind the scenes" view of your database). This is where you set up and configure your tables, forms, reports, etc.

As you continue working with MS Access, you will find yourself switching between Design view and Datasheet view (or in the case of forms, Layout view) often. So it's good to familiarize yourself with this concept early on.

### Switch to Design View

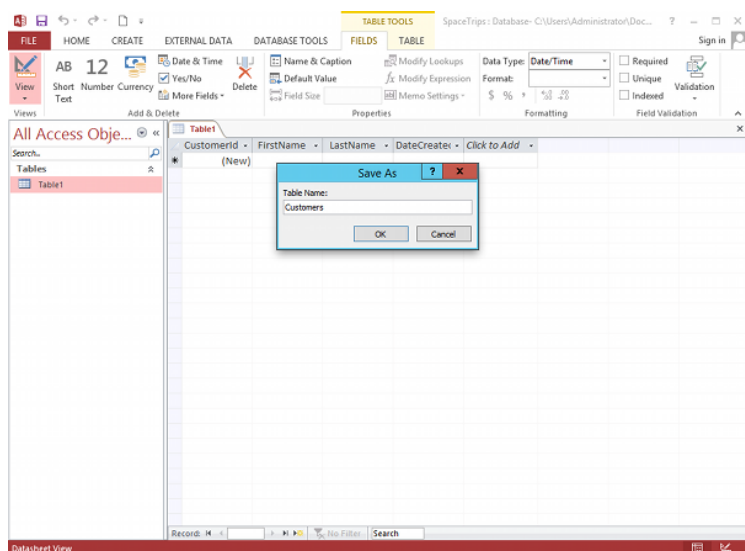
The following steps demonstrate how to switch to Design view.

1. Click on the View icon at the top left (just under the File menu).  
The View icon currently looks like this:
2. At this point, Access will ask you to name and save the table you just created. Type Customers and click OK
3. You are now looking at your Customers table in Design view. Click on the Date Created field, then in the bottom pane, enter =Now() in the Default Value field.
4. Also click in the Format field and select General Date from the contextual menu:



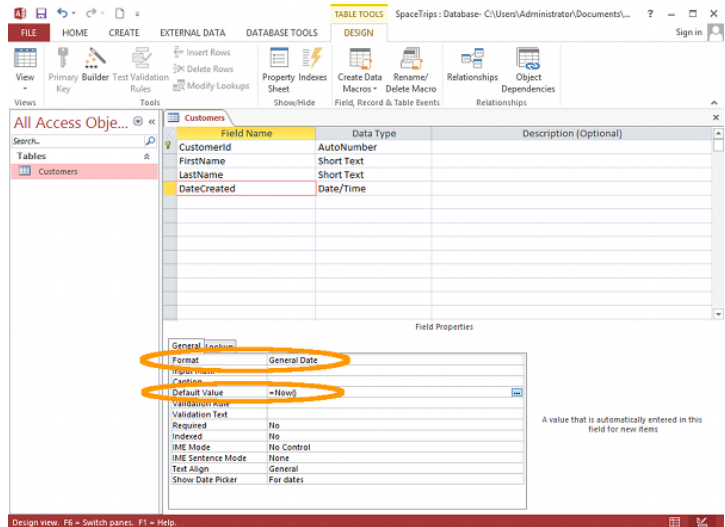
We have just set a default value for the *DateCreated* field. This means that, whenever a new record is entered, this field will automatically be populated with the current date and time. We have also specified a format for all dates that are stored in this field.

You can see that we have configured just two of many options in this pane. These options can be used to further specify exactly what type of data can be entered into the database as well as any constraints or defaults that you'd like to set against each field. Some options include restricting the length of data (under Field Size), setting a default value (which we've just done), specifying whether it is a required field, and more.



In practice, you will probably want to tighten some of these rules down - like specifying whether a field is a required field or not (i.e. can't be left blank). But for the purposes of this tutorial, we won't get too fussy.

You'll also see that the Ribbon now has a DESIGN tab with a new set of design-related options.



## Primary Key

You might have noticed the little "key" icon to the left of the CustomerId field. This indicates that the field is a *primary key*. A primary key ensures that the data in this column is unique - no two values can be the same. This is important for when you want to perform queries or run reports against the table, and it is vital for [establishing relationships with other tables](#).

## Datasheet View

Now that we're in Design view, you might have noticed that the View icon looks different - it has changed from a Design view icon into a Datasheet view icon. It now looks like this:



View

Click the View icon to return to Datasheet view, and we'll look at the options for [adding data](#) to our table.

## Adding Data in Microsoft Access 2013

In Microsoft Access, there are many ways to add data to your database. Which method you choose will depend largely on how much data you need to add and whether the data already exists outside of Access.

Here's an explanation of the main methods of adding data to a database.

## Datasheet View

You can type directly into the table while it's in Datasheet view. While this is fine for smaller tables with a small number of records that are rarely updated, it's not suitable if you plan to maintain a lot of records. Maintaining even a small database can become a time-consuming task if records change frequently - especially if you need to update data that's spread across multiple tables. It's also not really suitable if there will be non-technical users maintaining the database. For non-technical users, it's better to create a nice user-friendly form.

## Form

You can set up a form, so that non-technical users can enter data into the form. Once they submit the form, the data is automatically inserted into the database. One of the great things about forms is that they can insert into many tables - saving you from having to open up each table to manually insert the data.

Access provides a form wizard, which steps you through the process to building a form. We'll cover this in the next lesson.

## SQL View

You can use SQL view to insert data into your database. You can also use SQL view to do many other things with your database (including creating tables). SQL (which stands for Structured Query Language) is the standard programming language for working with databases.

To select SQL View from the Ribbon, select CREATE > Query Design, (close the popup table - called Show Table), then select SQL View.

## External Data

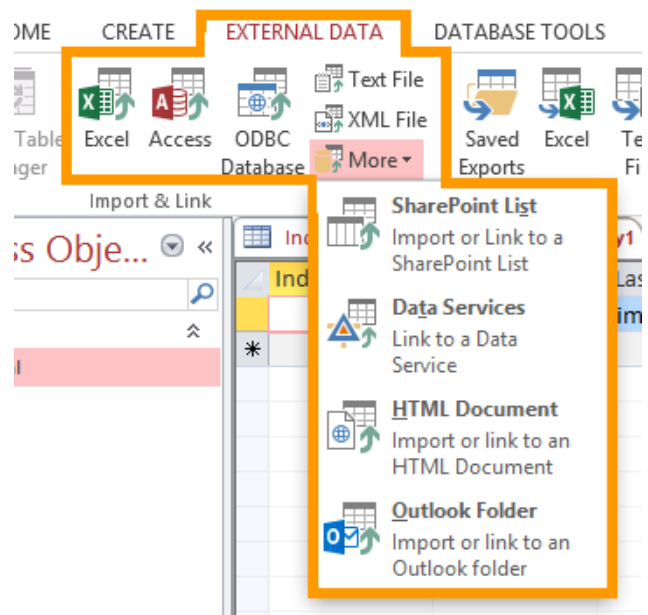
There may be times when you need to load your database with data that already exists. For example, you might have data in an Excel spreadsheet or even a .csv file that you want to transfer to an Access database. This can be done!

Access 2013 allows you to import data from the following file types:

- Microsoft Excel
- Microsoft Access
- ODBC Databases, such as SQL Server
- Text or comma-separated value (CSV) files
- SharePoint List
- XML
- Data Services
- HTML Document
- Outlook folder

To import data from any of these file types, select **EXTERNAL DATA** from the Ribbon, select the file type, then follow the prompts:

You can also use this menu to *link* to various file types (as opposed to *import* them). Doing this will enable you to provide up to date data from external databases or files. This option does carry some restrictions depending on the file type.



**Access 2013 can link to the following file types:**

- Microsoft Excel (read-only)
- Microsoft Access
- ODBC Databases, such as SQL Server
- Text or comma-separated value (CSV) files (add new records only)
- SharePoint List
- Data Services (read-only)
- HTML Document
- Outlook folder

For now, we will create a form to enter data into our Customers table.

## 8.2 Create a Relationship in Microsoft Access 2013

A primary feature of relational databases is that they contain multiple tables, each of which can have a relationship with any of the other tables. So far we've only created one table and it's a bit difficult trying to establish a relationship with another table when you're the only table in the database!

Our database needs more than one table anyway, because we need to be able to track not only customers, but also products, as well as the products the customers actually purchase.

So let's create two more tables and establish a relationship between them. One table will hold *product* information, the other will hold *order* information.

### Create the Related Tables

Go ahead and create two tables as follows.

Customers	
Field Name	Data Type
ProductId	AutoNumber
ProductName	Short Text
Price	Currency
DateCreated	Date/Time

Orders	
Field Name	Data Type
OrderId	AutoNumber
CustomerId	Number
ProductId	Number
DateCreated	Date/Time

Be sure to set a format and default value for the DateCreated fields on both tables (the user shouldn't need to enter this field - the system can do that).

General		Lookup
Format	General Date	
Input Mask		
Caption		
Default Value	=Now()	
Validation Rule		
Validation Text		
Required	No	
Indexed	No	
IME Mode	No Control	
IME Sentence Mode	None	
Text Align	General	
Show Date Picker	For dates	

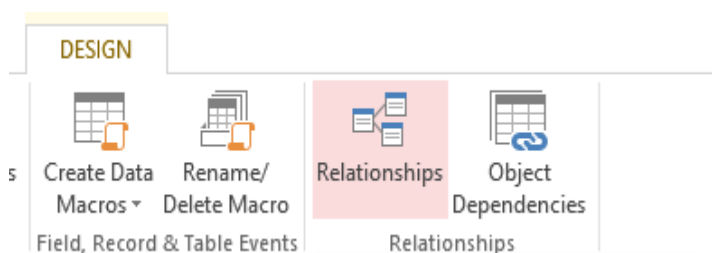
## Primary Key

Remember that the key icon indicates that the field is a primary key. A primary key ensures that the data in this field is unique - no two values can be the same. A table must have a primary key before a relationship can be established with another table. Access automatically sets the ID field as a primary key, so as long as you simply rename ID to ProductId (or OrderId as the case may be) it will already be a primary key. If for some reason your table doesn't have a primary key set, or if you want to change the primary key field, you can simply right click on the field header (in Design view), and select Primary Key from the contextual menu.

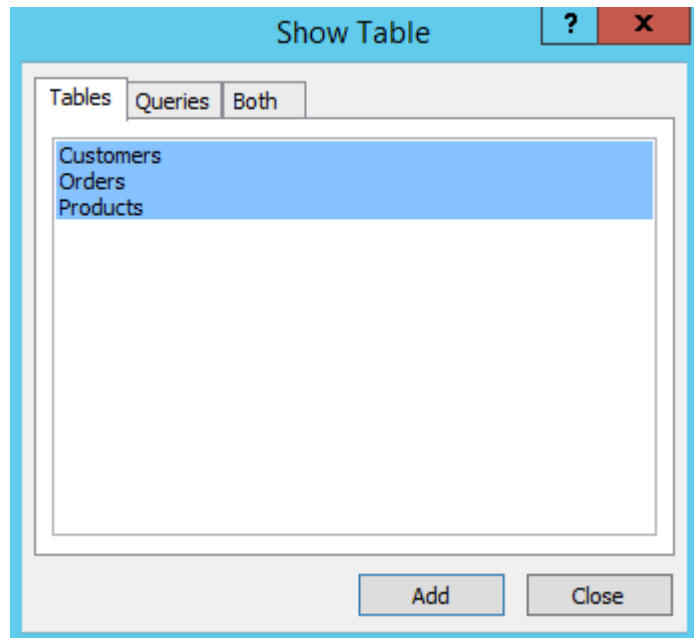
## Establish the Relationship

Now that you've created two extra tables, our database has three tables. Now it's time to create the relationship between all three tables.

1. While viewing a table in Design view, and ensuring that the DESIGN tab is selected, click Relationships from the Ribbon:



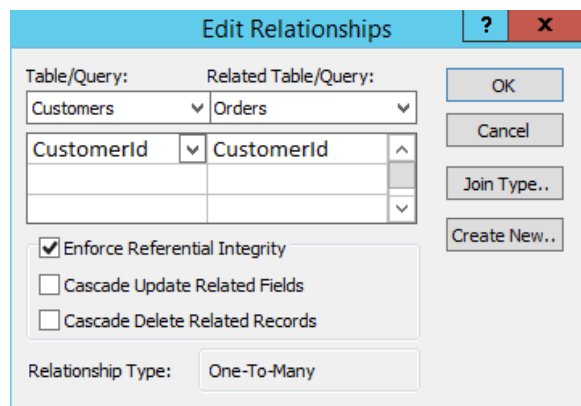
2. A Show Table dialog box will pop up, displaying all three tables. Select all of them and click Add:



3. Click Close to close the dialog box
4. You will now see three boxes which represent your three tables. Click and drag the CustomerId from the Customerstable across to the

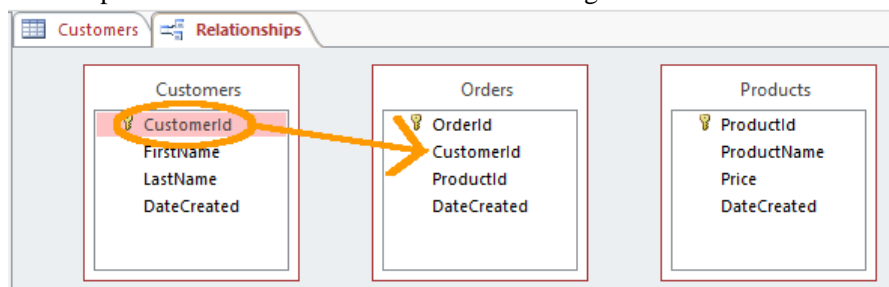
corresponding CustomerId field on the Orders table:

5. The Edit Relationships dialog will pop up. Click Enforce Referential Integrity so that it is checked. Check that the values are the same as the following screenshot and click OK:



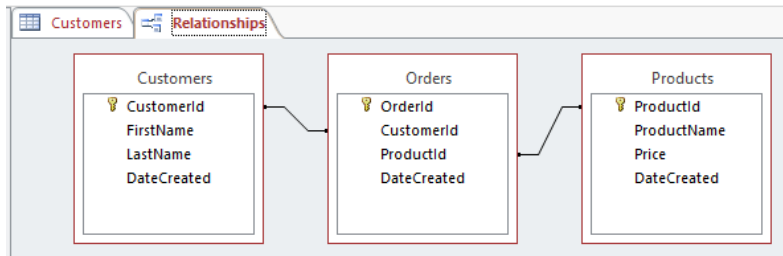
You will now see a line established between the CustomerId field on the Customers table and the CustomerId on the Orders table.

6. Now do the same for the Products table. That is, click and drag the ProductId from the Products table across to the corresponding ProductId field on the Orders table. Your table relationships should look like the ones in the following screenshot:



## Relationship Types

We just established a many-to-many relationship. There are three types of relationships that you can establish between tables. These are as follows:



### Many-To-Many Relationship

This is what our example above uses. A row in table A can have many matching rows in table B, and vice versa. In our case, a single customer can order many products, and a single product could have many customers. You create a many-to-many relationship by using a third table, called a junction table (more on that below).

### One-To-Many Relationship

This is the most common relationship type. You don't need a third (junction) table for this type of relationship. In this type of relationship, a row in table A can have many matching rows in table B, but a row in table B can have only one matching row in table A. For example, a row in a Gender table (which contains the records Male and Female) can have many matching rows in a Customers table, but a row in the Customers table can only have one matching row in the Gender table. That is unless there was a business rule that allowed customers to be male *and* female at the same time. In this case, a many-to-many relationship would need to be established.

### One-To-One Relationship

A row in table A can have only one matching row in table B, and vice versa. This is not a common relationship type, as the data in table B could just have easily been in table A. This relationship type is generally only used for security purposes, or to divide a large table, and perhaps a few other reasons.

The type of relationship that you use depends on the table structure and how the fields are

## Primary Key vs Foreign Key

We already know that a *primary key* ensures that the data in the field is unique. This is important because our Orderstable needs a unique value in order to reference any record from the other tables. For example, it can't use the FirstName field because there could be more than one person with a given first name. And it can't use the DateCreatedvalue because it's possible that two records could be created at exactly the same time (eg, if two operators are entering data or if many records are imported from an external source). This is why we need at least one field that we *know* will only ever contain a unique value.

A *foreign key* is simply the primary key's corresponding field in the related table. So in our example, the CustomerId field in the Orders table is a foreign key, while the CustomerId field in the Customers table is a primary key. Likewise, the ProductId field in the Orders table is a

foreign key, while the ProductId field in the Products table is a primary key. The fields don't necessarily need to have the same names but it's a good practice to get used to. It will definitely make the database structure easier to understand - especially when you start adding more tables that also need to have relationships established.

## Unit 9 Queries

### 9.1 Introduction to Query

#### 9.2 Working with Query

## 9.1 Introduction to Query

### Create a Query in Microsoft Access 2013

A *query* refers to the action of instructing the database to return some (or all) of the data in your database. In other words, you are "querying" the database for some data that matches a given criteria. The queries are run against one or more tables to return only the data that you're interested in.

For example, you might like to see a list of all individuals whose last name is "Griffin". Or you might like to see a list of all users who have registered with your database over a given time period. You might also want to see which customers have ordered a particular product. To do all this, you need to perform a query.

### Sample Data

Before we start querying the database, we should probably make sure we've got enough data in there first. Otherwise it doesn't matter how good our queries are - they will all return zero results if there's zero data. So let's add some data.

Remember, the ID columns and DateCreated columns are automatically generated, so you only need to enter data into two columns in each table.

### Customers Table

Feel free to make up your own data. Here's mine:

### Products Table

Feel free to make up your own data. Here's mine:

Customers				
	CustomerId	FirstName	LastName	DateCreated
+	1	Homer	Simpson	13/06/2014 3:33:37 PM
+	2	Peter	Griffin	13/06/2014 9:09:56 PM
+	3	Stewie	Griffin	13/06/2014 9:16:07 PM
+	4	Brian	Griffin	13/06/2014 9:16:36 PM
+	5	Cosmo	Kramer	13/06/2014 9:16:41 PM
+	6	Philip	Fry	13/06/2014 9:17:02 PM
+	7	Amy	Wong	13/06/2014 9:22:05 PM
+	8	Hubert J.	Farnsworth	13/06/2014 9:22:19 PM
+	9	Marge	Simpson	13/06/2014 9:22:37 PM
+	10	Bender	Rodríguez	13/06/2014 9:22:52 PM
+	11	Turanga	Leela	13/06/2014 9:23:37 PM
*	(New)			15/06/2014 9:00:01 PM



Products		Ord...			
	ProductId	ProductName	Price	DateCreated	C
+	1	Venus Carrera ET	\$190,000.99	15/06/2014 3:21:23 PM	
+	2	Mars Dreamliner 787	\$82,000.00	15/06/2014 3:21:53 PM	
+	3	Mercury Riser 2020	\$55,000.00	15/06/2014 3:22:20 PM	
+	4	Pluto Mini Racer	\$25,000.00	15/06/2014 3:22:23 PM	
+	5	Mars Daytripper	\$35,000.00	15/06/2014 3:22:28 PM	
+	6	Saturn SUV	\$65,750.00	15/06/2014 3:22:53 PM	
+	7	Neptune 9000 Turbo	\$88,990.00	15/06/2014 3:23:17 PM	
*	(New)		\$0.00	15/06/2014 4:08:53 PM	

## Orders Table

Again, feel free to make up your own **but** you will need to make sure that the value in the CustomerId and ProductId fields match an actual ID in the respective tables. For example, if your Orders table contains a CustomerId of 5, you will need to make sure there's an actual customer in the Customer table with a CustomerId of 5. Here's some sample data for the Orders table:

Orders				
OrderId	CustomerId	ProductId	DateCreated	C
1	1	1	15/06/2014 4:08:55 PM	
2	2	2	15/06/2014 4:20:22 PM	
3	10	3	15/06/2014 4:20:26 PM	
4	10	4	15/06/2014 4:20:46 PM	
5	3	5	15/06/2014 4:20:59 PM	
6	4	1	15/06/2014 4:21:06 PM	
8	5	3	15/06/2014 8:14:44 PM	
9	6	6	15/06/2014 8:15:02 PM	
10	7	4	15/06/2014 8:19:03 PM	
11	8	2	15/06/2014 8:19:06 PM	
12	1	6	15/06/2014 8:19:14 PM	
13	6	1	15/06/2014 8:19:27 PM	
*	(New)	0	15/06/2014 9:08:57 PM	

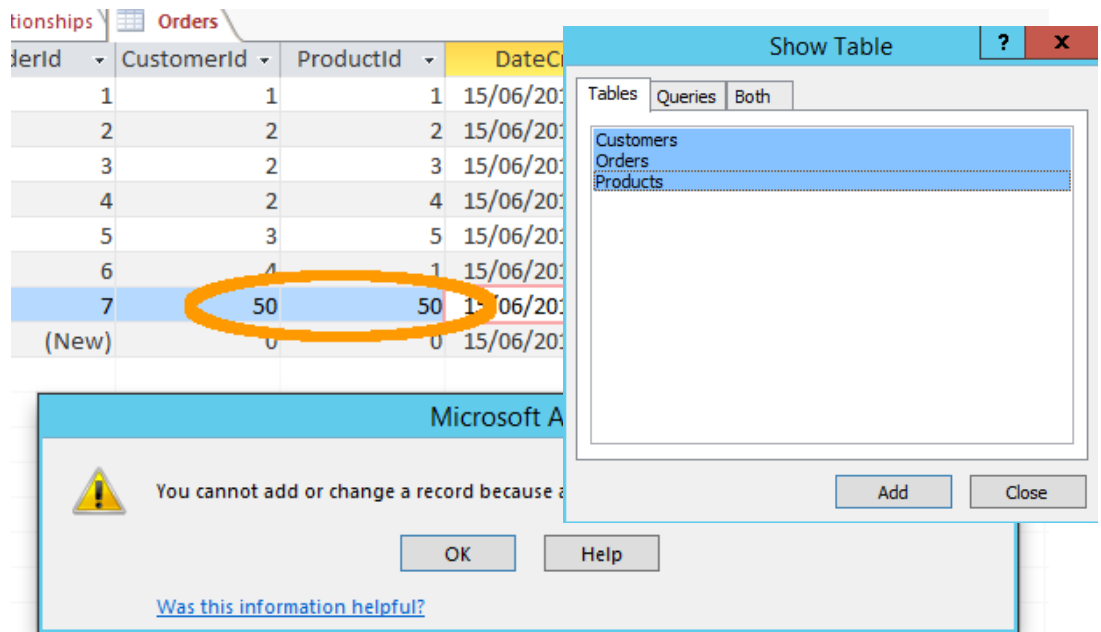
## Referential Integrity

When you create a relationship, you also have the option to Enforce Referential Integrity (which we selected when we created our relationship). This prevents foreign key values from having no corresponding primary key value in the referenced table.

Using our tables as an example, let's say you have 10 records in the Customers table (with a CustomerId of 1 to 10), but your Orders table contains a record using a CustomerId of 11. In this case, referential integrity has not been maintained. If you had enforced referential integrity on the relationship (as we have), Access would prevent this from happening.

Below is a screenshot of what will happen if you attempt to enter a value that would breach referential integrity. In this case I tried to enter a CustomerId of 50 and a ProductId of 50, but my Customers and Products tables don't have a CustomerId of 50 or a ProductId of 50:

Note that you will only get this message if you have enabled Enforce Referential Integrity. If you hadn't enforced referential integrity, Access would have happily let you enter the meaningless values and the referential integrity of your database would have flown out the



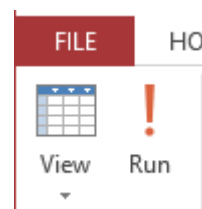
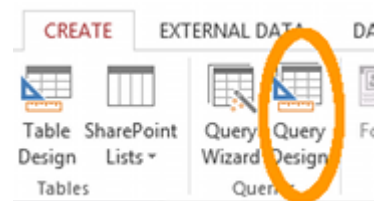
window.

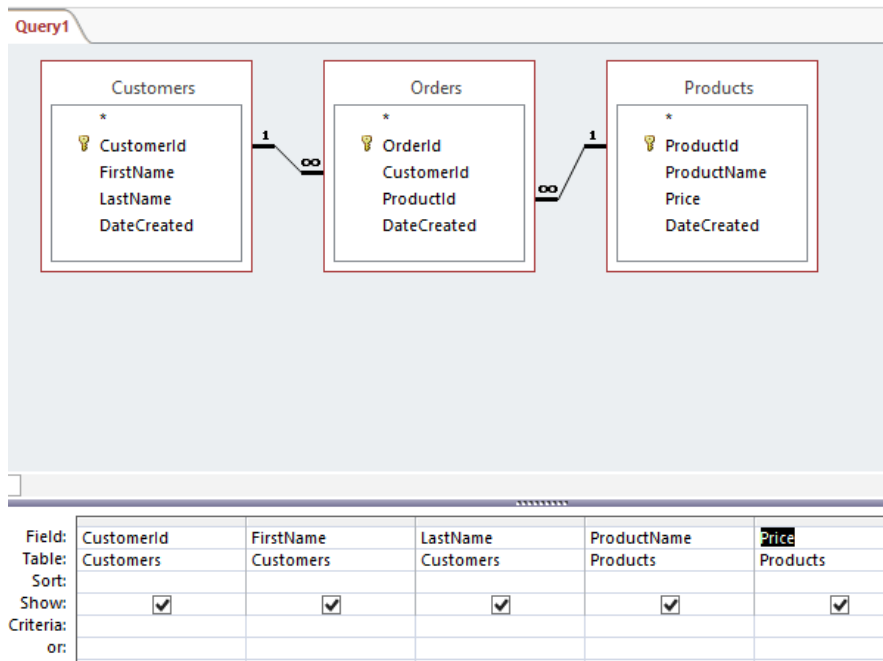
## 9.2 Working with Query

### Create the Query

Now let's create a query that returns the names of all customers who have ordered a product.

1. Ensuring you have the CREATE tab open on the Ribbon, click Query Design
2. The Show Table dialog box will appear with all of our tables listed. Select all three tables and click Add, then click Close:





- The three tables are now represented in the top pane (beneath the Ribbon). Choose the fields you'd like to be presented in the results of your query.
- You can either double click on the field name or click and drag it down to a column in the bottom pane. Select the fields as follows:

Query1

CustomerId	FirstName	LastName	ProductName	Price
1	Homer	Simpson	Venus Carrera ET	\$190,000.99
2	Peter	Griffin	Mars Dreamliner 787	\$82,000.00
10	Bender	Rodríguez	Mercury Riser 2020	\$55,000.00
10	Bender	Rodríguez	Pluto Mini Racer	\$25,000.00
3	Stewie	Griffin	Mars Daytripper	\$35,000.00
4	Brian	Griffin	Venus Carrera ET	\$190,000.99
5	Cosmo	Kramer	Mercury Riser 2020	\$55,000.00
6	Philip	Fry	Saturn SUV	\$65,750.00
7	Amy	Wong	Pluto Mini Racer	\$25,000.00
8	Hubert J.	Farnsworth	Mars Dreamliner 787	\$82,000.00
1	Homer	Simpson	Saturn SUV	\$65,750.00
6	Philip	Fry	Venus Carrera ET	\$190,000.99
*(New)				

5. Click the Run button at the top-left part of the Ribbon:
6. You should now see the result of the query. Here's mine:
7. Save the query by right-clicking on the Query1 tab and giving it a name. Call it Customer Orders:

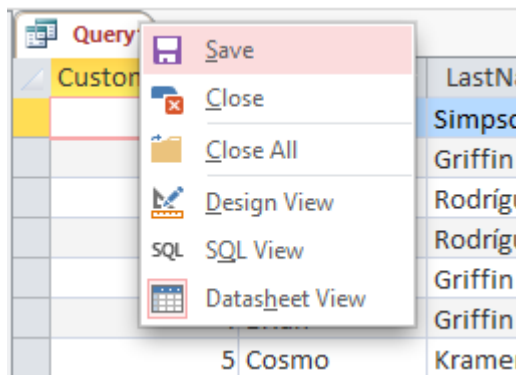
### So What Does Our Query Actually Do?

Our query successfully returns all customers who ordered at least one product and it includes the product and its price next to their name. You can also see that some customers have ordered more than one product. The query has automatically joined the three tables using the relationship that we created and returned the matching data.

This query will only return those customers who have ordered at least one product. If a customer is in the Customers table but does not order a product, that customer's record will not be displayed in the results of this query. If you look back at the Customers table (near the top of this page), you'll see that Marge Simpson is a customer but she hasn't ordered any products yet (i.e. she doesn't have a corresponding record in the Orders table). Well actually, Marge is only a *potential* customer. She simply expressed interest in buying a space ship. But that didn't stop the pesky sales person from adding her name into the database!

In any case, the query has done its job. We didn't want to see a big list of customers that haven't ordered anything yet.

Next we're going to modify our query so we can look at some of the other things we can do with queries.



### Modify a Query in Microsoft Access 2013

OK so we just created a query to return all customers in our database who have ordered a product. Now we'll see if we can tweak the query a little bit here and there to see what other results we can return.

#### Product Name

The marketing department wants to see who, if anyone, ordered their most expensive space ship. So, let's return a list of all customers who purchased the most expensive space ship - the "Venus Carrera ET".

- From Design view, in the bottom pane, enter "Venus Carrera ET" (double quotes included) into the Criteria field of the ProductName field:

Field:	CustomerId	FirstName	LastName	ProductName	Price
Table:	Customers	Customers	Customers	Products	Products
Sort:					
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:				"Venus Carrera ET"	
or:					

- Click the Run button in the Ribbon to view the results of the query. Alternatively, you can just click the Datasheet View icon. And here's the result:
- Once you're satisfied with the results, return to Design view and remove your modification

Customer Orders				
CustomerId	FirstName	LastName	ProductName	Price
1	Homer	Simpson	Venus Carrera ET	\$190,000.99
4	Brian	Griffin	Venus Carrera ET	\$190,000.99
6	Philip	Fry	Venus Carrera ET	\$190,000.99

(i.e. remove "Venus Carrera ET" from the Criteria field).

## Price

You could also modify your query so that it returns customers who purchased a product worth over a certain price.

So let's construct a query that returns all customers who purchased any product with a price over \$80,000.

- From Design view, in the bottom pane, add (>80000) into the Criteria field of the Price field:

Field:	CustomerId	FirstName	LastName	ProductName	Price
Table:	Customers	Customers	Customers	Products	Products
Sort:					
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:					>80000
or:					

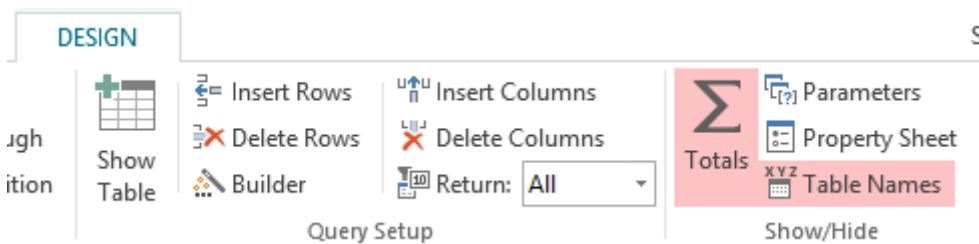
Customer Orders				
CustomerId	FirstName	LastName	ProductName	Price
1	Homer	Simpson	Venus Carrera ET	\$190,000.99
2	Peter	Griffin	Mars Dreamliner 787	\$82,000.00
4	Brian	Griffin	Venus Carrera ET	\$190,000.99
8	Hubert J.	Farnsworth	Mars Dreamliner 787	\$82,000.00
6	Philip	Fry	Venus Carrera ET	\$190,000.99

- Click the Run button in the Ribbon to view the results of the query. Alternatively, you can just click the Datasheet View icon. And here are the results:

### Price Using Totals

The previous query is all good and well, but there's one (potential) problem with it. While it certainly allows us to see all customers purchased a product over \$80,000, it doesn't really paint the full picture. It doesn't display those customers who may have purchased more than one product, each of which is *less* than \$80,000, but the total of which is *more* than \$80,000. Here's how we can capture that one.

- From Design view, click the Totals button in the Ribbon:



- You will now see a Total row in the bottom pane. Each field will have Group By. In the Price field, click Group By and select Sum.
- Click in the next row down (i.e. the Sort field) and select Descending. Keep the >80000 criteria in the Price field.
- You will also need to delete the ProductName column by selecting it and clicking Delete Columns (next to the Totals button on the Ribbon). It should now look like this:

Field:	CustomerId	FirstName	LastName	Price
Table:	Customers	Customers	Customers	Products
Total:	Group By	Group By	Group By	Sum
Sort:				Descending
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:				> 80000
or:				

- Run the query. And here are our big spenders:

Customer Orders				
CustomerId	FirstName	LastName	SumOfPrice	
6	Philip	Fry	\$255,750.99	
1	Homer	Simpson	\$255,750.99	
4	Brian	Griffin	\$190,000.99	
8	Hubert J.	Farnsworth	\$82,000.00	
2	Peter	Griffin	\$82,000.00	

You could spend a lot of time tweaking this one simple query. For example, here's some ideas:

- You could replace >80000 with >=80000
- You could remove the >80000 altogether
- You could sort by CustomerId instead
- You could use >50000 And <80000 (or any other price range)
- And much more...
- 

Once you're done, you can either save your new query or keep the original query. For the purposes of our macro lesson, you might like to keep the original query. However, you can always create and save multiple queries if you're so inclined.

So as you can see, queries can be very powerful. Imagine what you could do if you had more tables (and data) in your database.

Just make sure your query names are descriptive of what the query is doing. Otherwise you might find it difficult to distinguish between queries once you have a good number of queries within your database.

So far, all our queries have been constructed using Design view (and then checking them in Datasheet view). There is actually *another* view that we can use to create and modify queries. That view is SQL View.

### SQL View in Microsoft Access 2013

The queries that we created and modified were all done in Design view. This is a user-friendly interface that allows you to create queries easily by visualizing the tables used in the query and having options made available to you.

But whenever you use Design view to construct a query, behind the scenes, MS Access is constructing an SQL statement in order to make the query work. For every query you create, there's an SQL statement hiding in the background.

Well it's not quite "hiding"... after all, you can view it any time you wish. To do this, you need to go into SQL View.

### Switch to SQL View

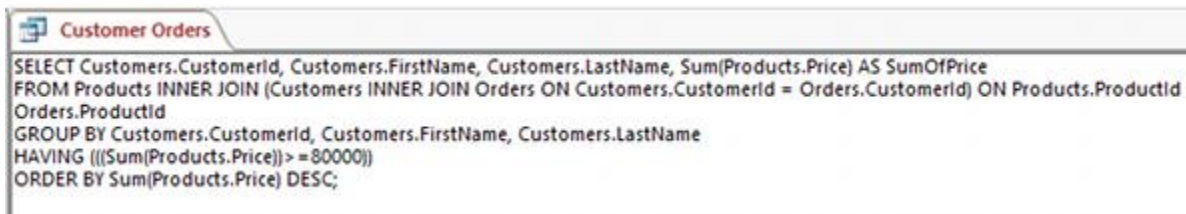
To switch to SQL view, you simply click the SQL icon at the bottom-right corner of Access:



You can also choose SQL View from the View icon at the top-left of the Ribbon.

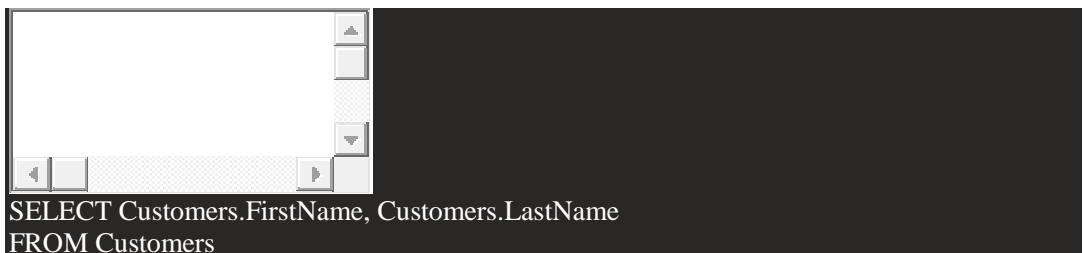
### SQL Statement

Once in SQL view, you will see a SQL statement. This SQL statement represents the query that you constructed. Here's the SQL view of the last query that we performed:



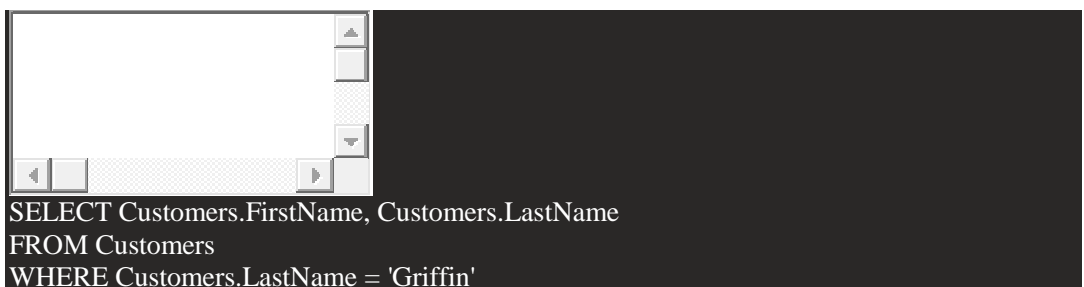
```
SELECT Customers.CustomerId, Customers.FirstName, Customers.LastName, Sum(Products.Price) AS SumOfPrice
FROM Products INNER JOIN (Customers INNER JOIN Orders ON Customers.CustomerId = Orders.CustomerId) ON Products.ProductId
Orders.ProductId
GROUP BY Customers.CustomerId, Customers.FirstName, Customers.LastName
HAVING ((Sum(Products.Price)) >= 80000)
ORDER BY Sum(Products.Price) DESC;
```

If you're not familiar with SQL, this might look a little scary. But it needn't be that way. That SQL statement is simply extracting records from the database using our precise criteria. Let's look at a less complex SQL statement:



```
SELECT Customers.FirstName, Customers.LastName
FROM Customers
```

The above SQL statement returns the FirstName and LastName fields from the Customers table. It returns *all* records, because we didn't specify otherwise. If we wanted to specify only *some* records, we would need to add some criteria to the statement. Here's a modified statement:



```
SELECT Customers.FirstName, Customers.LastName
FROM Customers
WHERE Customers.LastName = 'Griffin'
```

Like the first example, the above SQL statement returns the FirstName and LastName fields from the Customers table. But in this example, we are only returning records where the customer's last name is "Griffin".

As you can see, each time we add criteria to our query in Design view, that criteria is added to the SQL statement, and we can limit the results by only those exact records that we are interested in.

These are simple examples to demonstrate how SQL works. Feel free to tweak queries in Design view and switch over to SQL view to see how it changes the SQL statement. If you're interested in learning more about SQL, check out my [SQL tutorial](#).



## Export Access 2013 Database to Excel

Most Access users will, at some point, need to export their Access database to an Excel spreadsheet. OK, most users don't need to export the whole Access *database* - they will usually only need to export a *table* or the results of a *query* to Excel. Once in Excel, they can use the data as they would normally use data in Excel.

Excel isn't the only format that you might want to export data to. You might want to export from Access to XML, HTML, CSV file, or even a PDF file. Fortunately you can do all of these in Access 2013.

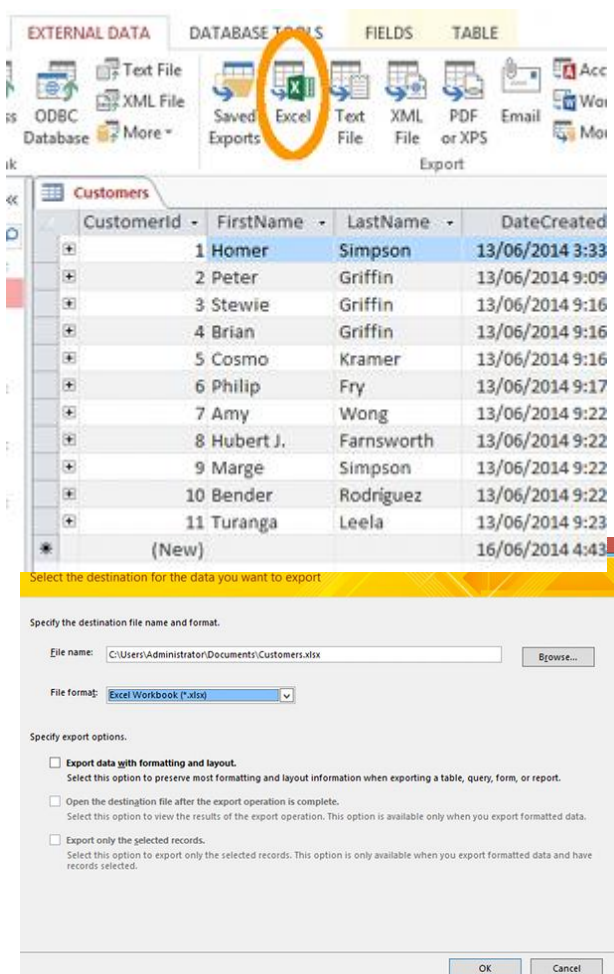
### Export to Excel

Here's how you export data from MS Access to Excel.

1. Open the table or query that contains the data you want to export
2. Ensuring the EXTERNAL DATA tab is selected on the Ribbon, click the Excel download icon (this is the one with the downward facing arrow):
3. Click OK to save the file at the default location. Alternatively, change the location and/or a file name. You can also select any other options you wish to include:
4. Click Close. Alternatively, you could select Save Export Steps before clicking Close.

You now have an Excel spreadsheet containing the data from your query that you can send to anyone you like.

As you can see from the Ribbon, you can export to other file types such as XML, text file, and even PDF documents. The steps are similar to the above. Why not try them out?



## Unit 10 Forms

### 10.1 Forms Basics

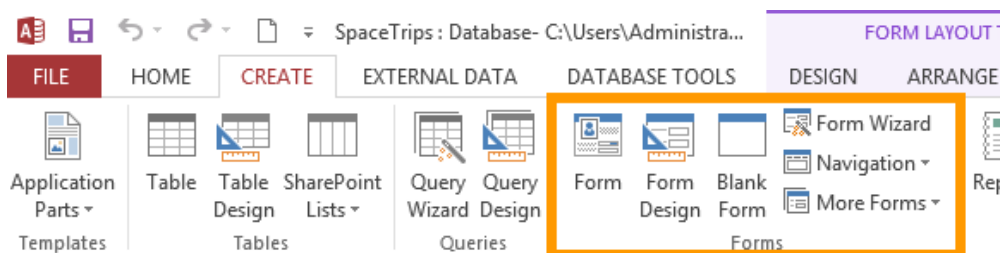
#### 10.2 Working with Forms

### 10.1 Forms Basics

#### Create a Form in Microsoft Access 2013

As mentioned, Access forms provide non-technical users the ability to add data to your database. Forms also make it easier to insert data across multiple tables.

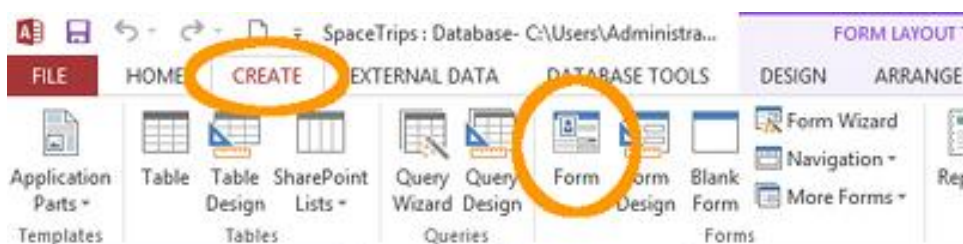
There are several methods to create a form (as you can see by the following screenshot):

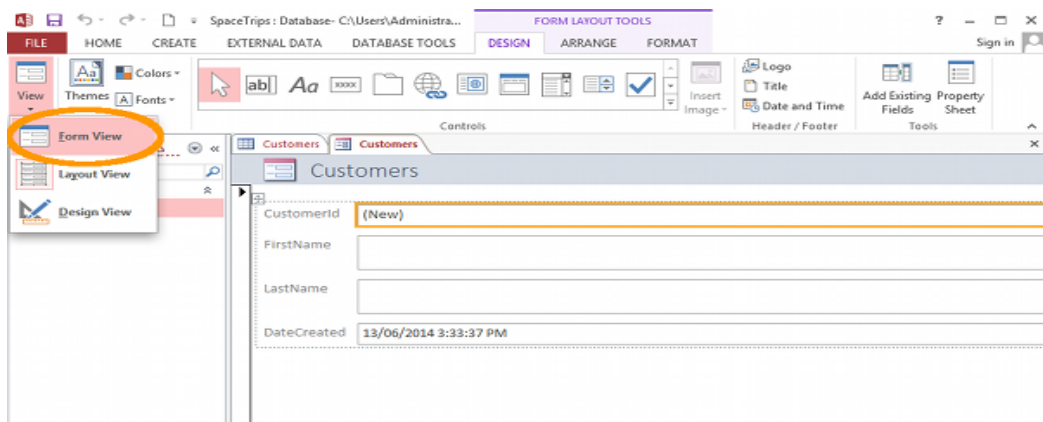


Options include using the Form Wizard, Design view, and even starting with a blank form. The option you choose will depend on your own preference and perhaps the type of form that you want to create. The Navigation option is for creating a form that allows the user to navigate database objects such as other forms. The Form Wizard option steps you through the process of creating a form. If you use the Form Wizard, you can always modify the form later using Design view.

For the purposes of this tutorial, we'll create our form as quickly as possible. Then we'll go back and modify it later. Here's the quickest way to create a form in Access.

1. Ensuring that the Customers table is selected (in the left navigation pane), from the Ribbon, select CREATE > Form

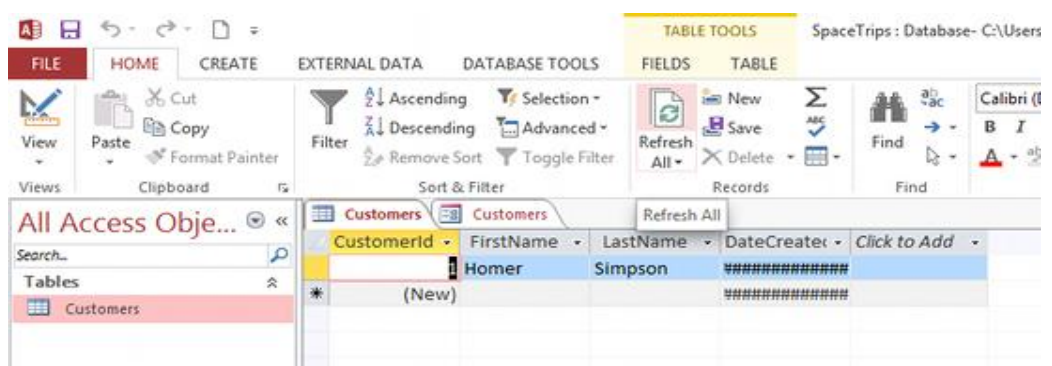




2. Access has just created a brand new form in Layout view, based on the fields in the Customers table. Click on the inverted triangle under the View icon and select Form View:
3. This is how the user will see the form. Go ahead and enter data into the FirstName and LastName fields. Be sure to hit Enter after you've entered the last name. Then hit enter again to add another record.
4. Now let's check our table. Click Customers in the left navigation, then click Refresh All on the Ribbon. You should now see your newly created record in the table:

The screenshot shows the 'Customers' form in Form View. The fields are filled with the following data:

CustomerId	1
FirstName	Homer
LastName	Simpson
DateCreated	13/06/2014 3:33:37 PM

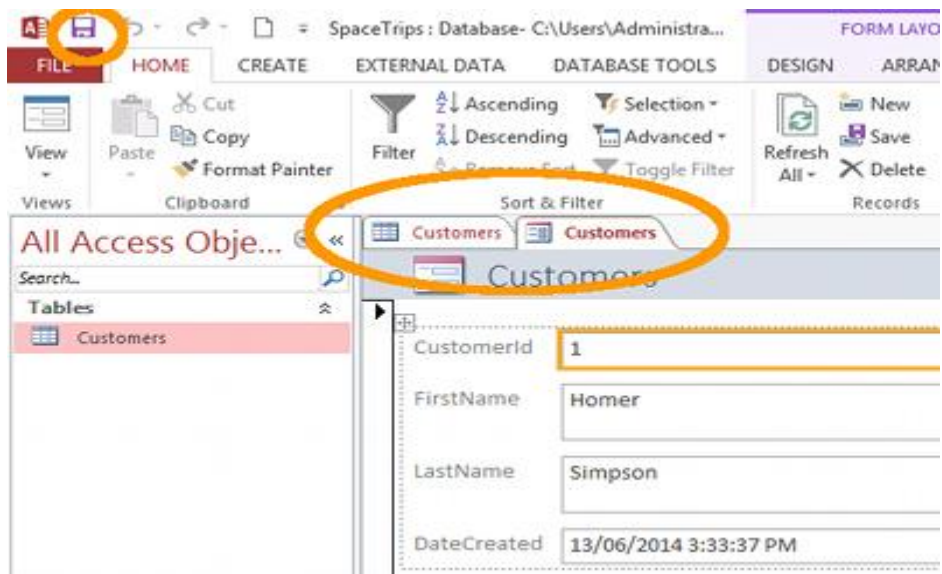


You might notice that the Date Created field is full of hashes symbols #####. This is because the column is currently too narrow to display the data. You can resize the column to fit the data by double clicking at the side of the column header. First, move the cursor to the edge of the column header until it changes appearance into a resize tool, then double click. The column should now be wide enough to display the data:

LastName	DateCreated	Click to Add
Simpson	13/06/2014 3:33:37 PM	
	13/06/2014 4:02:23 PM	

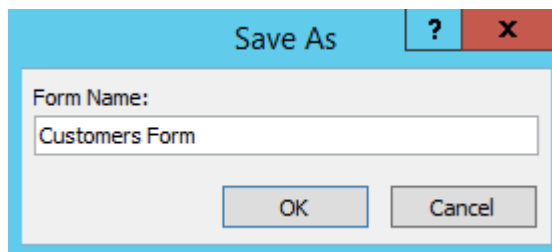
Now let's switch back to the form and save it.

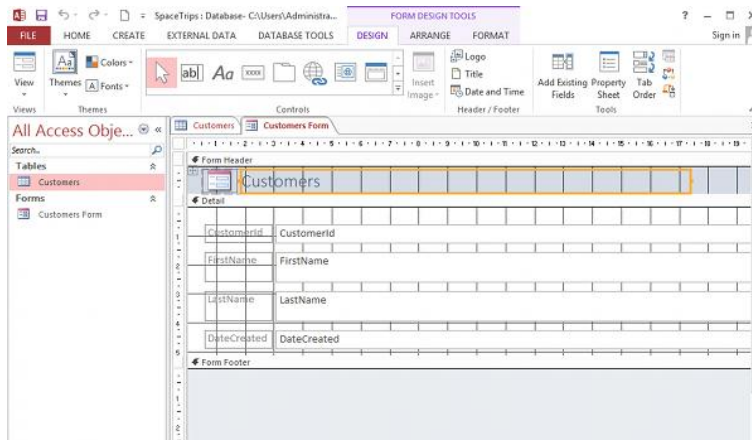
1. Click on the second tab called Customers (the first one is for the Customers table), then click the Save icon in the top left (above the Ribbon):



2. Rename your form Customers Form when prompted:

The form will now appear in the left navigation column under the heading Forms.





## 10.2 Working with Forms

### Modify a Form in Microsoft Access 2013

So we've just created a form. While the form works as expected (i.e. it enters data into the database table), it could certainly be improved upon.

Here, we'll give the form a fresh new look and we'll also prevent users from modifying the DateCreated field.

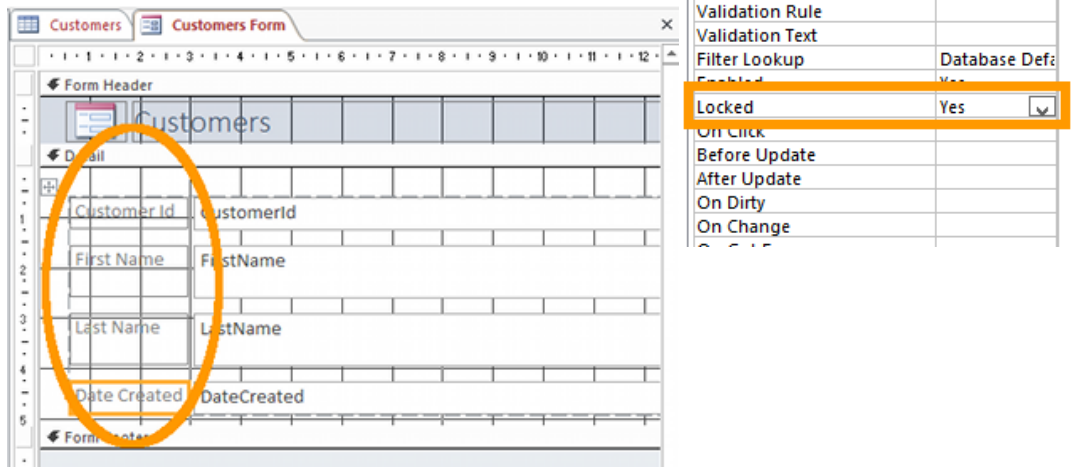
Although we've been using the Views icon on the Ribbon to switch views, you can also switch views by using the icons at the bottom right of Access (screenshot below).

#### Design View

1. Click the Design view icon at the bottom right corner of Access (you can also use the icon at the top left of the Ribbon if you prefer):
2. Click on the DateCreated field, then click Property Sheet. The Property Sheet will appear to the right of the form:
3. On the Property Sheet, scroll down until you see the Locked option. Change its value to Yes using the drop down control.

We have just "locked" the DateCreated field so that users can't change it. This field is intended to store the date that each record was first entered into the system. Therefore its value should never change. By locking the field users can't inadvertently (or even maliciously) change it. We can still display the field, for the users' information, but we don't want them changing it.

- Next, select the CustomerId label (the label is the one on the left - don't touch the ones on the right), and add a space so that it becomes Customer Id. Do the same for the other fields. This just makes the form a bit more readable and more presentable, as the labels are what the user sees. It should look like this:



- Now close the Property Sheet and switch to Layout view.

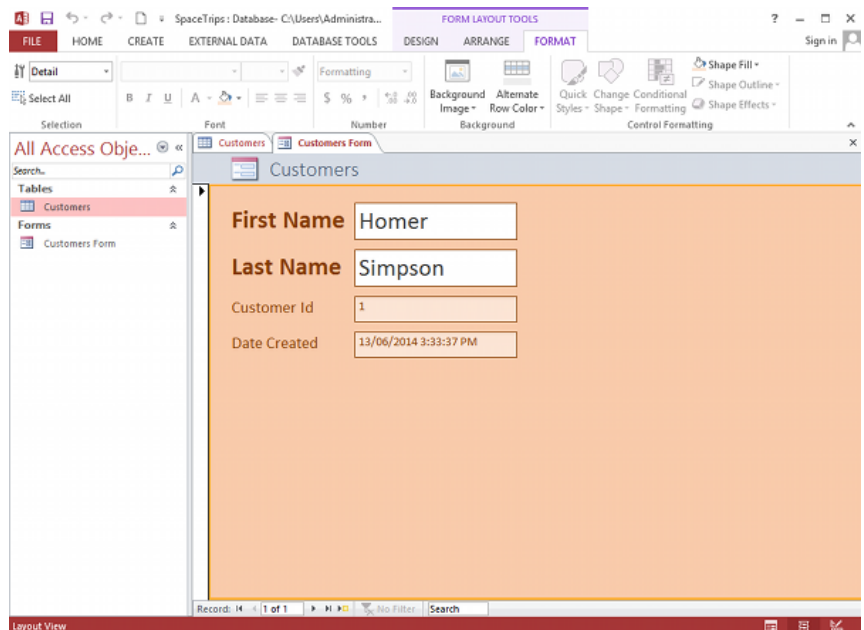
### Layout View

It's time to give our form a new look.

- In Layout view, click in a blank part of the form (i.e. away from the fields). This should select the form detail area.
- From the Ribbon, select a background color for the form:
- Now feel free to format some of the other elements on the page. For example, background colors on each field, change the border color of each field, bold the labels, etc. If you want to select multiple fields, hold the Shift key down while you select them. You can even move fields around by clicking and dragging them. And you can resize the fields by clicking and dragging their edges (you can also do it via the Property Sheet). Don't forget to save the form once you're happy with it. Here's an example of how a form can look by doing just that:

## Form View

Now switch back to Form view and see how the form looks and works. Enter in a few records. And a few more. You can also slide the Navigation Pane back to make more room for the form (you can do this in any view).



## Unit 11 Reports

### 11.1 Report Overview

### 11.2 Creating Report

#### 11.1 Report Overview

Reports are used in a database to present information in a neat and organized format that is ready for printing. When a report is opened in Access, it is opened in Print preview for this reason. Creating a report is very similar to creating a form and like a form, can be done using any of the following methods:

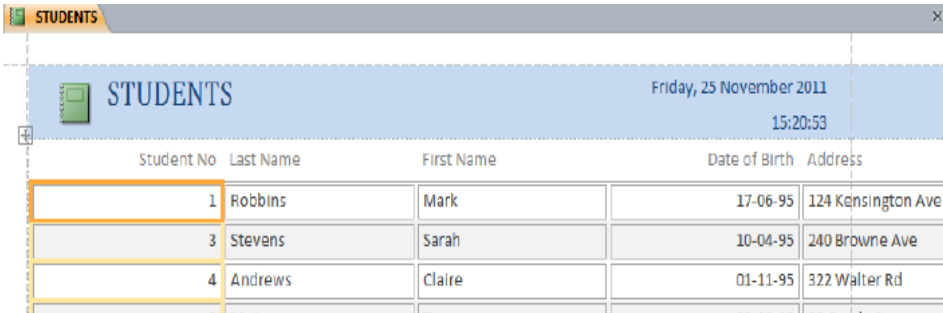
- Use an Auto report to create a form based on a standard layout.
- Use the Report Wizard.
- Use one of the above methods and then modify the report in Design View.
- Create a report completely from scratch using the Design View tools.



## 11.2 Creating Report

### Creating an Auto Report

1. Click the **Create** tab on the **Ribbon**.
2. Click the **Report** icon.



The screenshot shows a report window titled 'STUDENTS'. The header area is blue and contains the title 'STUDENTS' on the left and the date and time 'Friday, 25 November 2011 15:20:53' on the right. Below the header is a table with the following columns: Student No, Last Name, First Name, Date of Birth, and Address. The table contains three rows of data:



Student No	Last Name	First Name	Date of Birth	Address
1	Robbins	Mark	17-06-95	124 Kensington Ave
3	Stevens	Sarah	10-04-95	240 Browne Ave
4	Andrews	Claire	01-11-95	322 Walter Rd

The buttons in the bottom right of the Window provide access to the different report views.

- The first button selects the standard **Report View**.
  - The second button shows how the report will look when printed in **Print Preview**.
  - The last two options are both for modifying the report. The first of these, **Layout View**, allows you to modify the report while the report data is displayed. This provides an easy way to make adjustments to the report layout while having a good idea of how the changes will affect the report.
  - The last view is **Design View**. In design view you can't see the report's data as you make changes but it is necessary for some design changes that aren't possible with the Layout view.
3. Close the report. When prompted, save the report as *Student Report: Auto Report*. **Note** Reports are for displaying data. You cannot modify table data from a report.

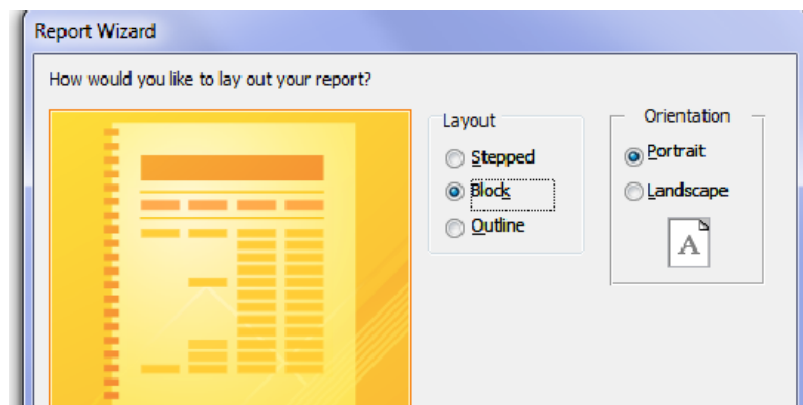
*Note Reports are for displaying data. You cannot modify table data from a report.*

### Using a Report Wizard

1. Click the **Create** tab on the **Ribbon**.
2. Click .  
3. In the **Tables/Queries** list, make sure that *table: STUDENTS* is selected.
4. Select the fields shown above.
5. **Double-click** on *Student Number* and *Comment* to move them back over to the left as shown above.



6. Click **Next** when ready.
7. The next step allows you to choose grouping levels for your report. **Double click** on *Gender* to select that as the grouping field. This means that all of the female students will be grouped together in the report and all the male students will be grouped together.
8. Click **Next** to continue  
This step in the wizard allows you to choose how the records in the report will be sorted. There are also options for adding totals and subtotals to your report.
9. In the first sort box, select *Last Name* as shown above. You can also select additional fields for sorting in case there are any records with the same last name.
10. Click **Next** to move to the next step.



11. Select **Block** for the report layout and click **Next**